FLASHES AND PLUGS

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During the chase, the bat hid somewhere and she lost it. She found it rather suddenly as she was crawling on her hands and knees with a flashlight, when it flapped from under a windowsill and made a beeline for her.

That's when the beleaguered lady gave up the fight, locked the bedroom door and called police. A crew of officers, dispatched to the scene, borrowed the broom and dispatched the bat.

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Rather high—considering that he didn't want to pay at all! The $61.20 was made up of the actual cost of the call, a fine and court costs—all because the concessioner used slugs instead of money when he made the long distance call from a pay station in the city hall. The actual cost of the call was $6.50.

It so happened that an employe of the Minnesota Community Telephone Co., Waterville, visited the pay station shortly after the call and discovered the slugs. They were about the same size and weight as quarters.

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He dialed what he thought was the number to his son-in-law's home.

It turned out to be a wrong number but he found he had called the house where the son-in-law was making plumbing repairs.

The Mountain States Telephone & Telegraph Co. says the odds were 30,000 to one against the coincidence.

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CIRCULATION

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

September 11, 1954

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★ ★ ★ IN THE ★ ★ ★ NATION'S CAPITAL

by FRANCIS X. WELCH WASHINGTON EDITOR

Maintenance of AT&T dividend challenged by Maryland commissioner in Chesapeake & Potomac company rate case. Other Bell rate pleas in New York and Kentucky covered. GSA leases private wire telegraph system. British TV viewers to see ads.

THE public service commission of neighboring Maryland has authorized the Chesapeake & Potomac Telephone Co. to raise its rates to produce an additional $2,316,000 income before taxes. This is calculated to yield the company a little more than a million dollars net income after taxes. It compares with the company's request of last November for a gross revenue increase of $6,864,000.

Maryland is a "fair value" state, which means that reproduction cost as well as original cost must be taken into account in fixing the rate base under decisions of the highest state court. The commission set the fair value of the telephone company's property for rate making at $155,157,989. On this it allowed a return of 6 per cent.

An interesting point was made in a dissenting opinion by Commissioner Wilmer Fell Davis, who wondered why the Maryland commission "does not join the neighboring states in rejecting the claims of the American Telephone & Telegraph Co., through the Chesapeake & Potomac Telephone Co., for higher telephone service charges."

Davis, who thought a 5.8 per cent return would be sufficient, saw no merit in the argument that Bell subsidiary companies must make enough money to insure the continuation of the traditional $9.00 per share dividend on AT&T stock. Pointing out that this was the fifth increase since the end of World War II, Commissioner Davis stated:

"It now becomes a contest between those who (own) this AT&T stock and the Maryland ratepayer as to whether the stockholder will receive this fixed dividend 'forever,' which places it in the category of a bond, or whether those who use the telephones will be compelled to constantly pay more and more for their use."

The fact of the matter is that mere maintenance of the $9.00 dividend gives the stockholder *no larger number of dollars* income per share than he has had for many years. While at the same time, this dividend is paid off in dollars of much less buying power. The ratepayer, on the other hand, is probably making more money in wages and paying more for everything else he uses, such as food, clothing, rent, etc. The suggestion that the telephone stockholders should actually take a cut in the established dollar earning dividend rate, rather than increase the cost of telephone service to the subscriber, would certainly pose a serious question to anybody even thinking about investing in the telephone business for the future.

Other Rate Cases

The New York Telephone Co. is evidently preparing to go to court, if necessary, to get rate relief denied by the state commission. On Sept. 2 the company asked the New York Public Service Commission for a rehearing of its request for an increase of 68.8 million dollars. It will be recalled that the commission rejected the petition in its entirety early in August. There was no indication when it would act on the rehearing plea.

This procedure is the usual step taken preliminary to a court appeal. Of course, it is possible that the commission will grant the rehearing. But, on the law of averages, the expectation is that the commission will stand pat. Then the company's remedies before the commission will be exhausted, and the case will be set up for court proceeding. Keith S. McHugh, president of the company, issued a statement repeating his company's contention that the commission's attitude was unrealistic and would damage the company's financial structure.

Mr. McHugh disagreed sharply with the economic and legal views cited in the commission order. "The decision in the long run is bound to hurt the financial soundness of the company and its ability to provide good telephone service," he contended. "It is ironical that in one of the best years of the post-war boom our earnings should be sliding steadily downward. So far this year we failed to earn the regular dividend by $1,574,000. For the full year 1954—a year in which other successful businesses will show substantial earnings beyond dividends—our prospects are that the regular dividend will not even be earned."

The commission admitted, he asserted, that telephone rates were only 16 per cent higher than before World War II, while living costs had risen 92 per cent. The commission agreed, he added, that the company had to build up its reserves in good times. "But when it sums up these factors in its opinion," he continued, "it fails to come to grips with realities. All it does is offer the wishful thought that business conditions will improve—that somehow, everything will be all right."

The rehearing petition revived the basic issue contained in the company's original application concerning the rate base and return. The company's petition for rehearing argues that it is wrong for the commission to reject current value and to adhere to strict original cost under prevailing inflationary conditions.

Over in Kentucky the state public service commission granted only a limited rate increase to the Southern Bell Telephone & Telegraph Co. The company had asked for a gross revenue increase of $4,418,000 a year. The commission allowed only an estimated increase of $1,245,769 a year. There will be no increase in residence or business exchange rates.

About half of the approved rate in-

creases will come from users of long distance service within the state. The rest will come from users of special services, such as teletypewriters, additional name listings in directories, charges for moving equipment, service connections, and restoration of service.

Southern Bell had contended that its Kentucky earnings had dropped to 4 per cent on its Kentucky investment and that it should be getting 6.75 per cent return.

Telegraph Leased-Wire Service for Uncle Sam

The General Services Administration (GSA), which is the housekeeping bureau for the normal civilian functions of all the federal agencies, has decided on its arrangements for leased-wire communications. A new high-speed private wire telegraph system has been inaugurated, according to an announcement on Aug. 30.

The system, operated by GSA and maintained by Western Union Telegraph Co., will handle messages between government agencies in 53 major cities. GSA announced in late January, 1954, that it was switching from the American Telephone & Telegraph Co. system of leased wires inaugurated during World War II to Western Union lines and equipment.

It might be noted, in passing, that GSA has been toying with the idea of throwing this business to the telegraph company for some time. It is not only supposed to help the telegraph industry, which needs all the help it can get; but it will also act as a check on the threatened growth of direct federal government operation of its own communications services. Aside from the fact that it is a nice piece of business for the telegraph company, GSA thinks that the federal government might save as much as $150,000 a year.

The 150,000-mile leased-line system is expected to handle a traffic capacity of 40 million words per year. The engineering is designed so that new circuits to additional cities can be added quickly if circumstances demand. The arrangement is also expected to avoid any further need for expansion of any government-owned or operated communications system for ordinary government purposes.

"By utilizing ultramodern techniques in communications engineering we will get more and faster service with less expense," GSA Chief Edmund F. Mansure observed. With the new rapid-written communications system, civilian agencies in any of the 53 cities can flash information to any other point on the network simply by pressing a key and sending the message. Those messages destined for other cities will be flashed over the system to the point nearest its destination. There it will leave the GSA-operated system to be picked up on the Western Union's commercial system for final delivery. At present, the GSA system will handle only certain administrative type messages for federal civilian agencies. Weather, flight, market, and security information will continue to be sent by special lines.

Mansure said the change was made after careful study, during which time the government benefited from the genuine free play of competition between the two communications industries. The selected telegraph system proposal was found to be better suited to the government's peculiar requirements, he said. Lines and equipment will be leased, as before, under tariffs set by Federal Communications Commission regulation. The rental is expected to average about $360,000 per year.

FIRST DUTY

"The first job of the American businessman is not his duty to his company, but his duty to his country."—CLARENCE B. RANDALL, *chairman of the board, Inland Steel Co.*

Plugs on British TV

An interesting comparison of subsidized government TV broadcasting with the commercial advertising variety which we get here in the United States begins next year in Great Britain. This would not seem like any great change to an American TV viewer. But to Britains the change is as revolutionary as if a Coca Cola sign were suddenly to blossom on the top of the Tower of London.

By Act of Parliament the British televiewers are going to get advertisements along with their TV programs. And if they feel like watching the commercials, they are now at liberty to do so. To bring about this drastic change, bitterly fought by the Labor Socialist Party, a new television network—one carrying commercial ads—is to be established to compete with the subsidized British Broadcasting Corp. (BBC).

The government network (BBC) has been in business for 30 years, financing its operations with a periodic tax levied on the owners of receiving sets. No taint of commercial advertisement has ever appeared on a BBC broadcast or telecast. But there have been complaints that they have been tainted with something else—dullness, mediocrity, to the point of smelling bad. Hence the decision of the Churchill government to break down the barriers and see what the advertising boys can come up with, in competition with BBC.

So, if a London TV set owner becomes bored or irritated by the advertising, he can twist back to BBC. If he becomes annoyed with the BBC postering and pontificating, he can switch over to the more rowdy fare promised by the commercial programs. Of course, he still has to pay his government tax to support BBC whether he looks at its programs or not. But at least he has some kind of choice, which is something he never had before.

The British government still holds a close rein on this new innovation on TV. Something known as the Independent Television Authority (ITA) has been established to build and operate the new system. Starting next year, this authority will sell time to broadcasters known in proper British form as "program contractors." These "program contractors" will sell advertising time, but the advertisers will have no control or influence on preparing the program.

Looking over the strict regulations already announced for the Independent Television Authority, we see some things quite amusing in comparison with our American practice. No give-away shows! Think what a hole that would make in American TV programs over a 12-hour stretch if we had such a limitation here. The ITA will not allow any more than six minutes of commercials per hour.

With an obvious frown at some of our more uncouth American practices, Sir Kenneth Clark, chairman of the authority, says he expects Britain must "do very much better" than the United States in the matter of good taste for commercials. This is all to the good if it works. It is to be hoped that it will not have the effect of making the ITA programs as dull as those which started the complaints about the BBC programs in the first place.

People in all lines of the communications industry, in the United States as well as in Great Britain, will follow with interest the progress of this new venture, which represents such a departure from the hidebound traditional pattern followed by BBC for the last three decades.

V V

"[There] is no country in the world where the process of self-criticism and self-correction is more active than in the United States."—SIR WINSTON CHURCHILL, *prime minister of Great Britain.*

The OPERATOR'S CORNER

by MAYME WORKMAN, Traffic Editor

PERHAPS I should be writing about cords and keys, traffic rules and "Number, Please?" but today I have only one thought in mind—the President of the United States, Dwight D. Eisenhower, who is coming to my home town, Springfield in Illinois, on this Thursday, August 19, to make an address at the Illinois State Fair. This is only the second time a President has visited our state fair. President Rutherford B. Hayes, 19th President of the United States, came in 1879, long before most of us were born.

From the President's arrival at the airport at 10:30 Thursday morning until his departure in the afternoon, great masses of people greeted him on every hand. Immediately upon his arrival, the President repaired to Oak Ridge Cemetery where he placed a wreath on Lincoln's tomb. Here, too, he was greeted by a large number of people from Springfield and neighboring towns.

Highways leading to Springfield were congested with cars driving bumper to bumper. Some 225,000 people were in attendance at the state fair, the largest number in history, the previous record being 160,000.

Our Governor, William G. Stratton, entertained the President at luncheon in the Governor's mansion, just five blocks from my home and office. I decided this was the best place to see the President, as he was scheduled to leave the mansion for the state fair grounds at 12:40 p.m. Hundreds of citizens and visitors had the same idea judging from the crowd present, among whom were many telephone folk.

Thursday, August 19, was a busy morning in my office and, when I glanced at the clock, I realized I had but a few minutes to get to the Governor's mansion. I quickly changed my shoes (I always wear an old pair in the office as I scuff them so badly on my typewriter chair), and hurried to join the throng waiting for the President. We didn't wait long as he appeared a few minutes before the scheduled time for his departure to the fair grounds. He stood in the car and waved to us, and what an ovation he received! It must have been heartwarming to the President. He flashed his famous smile and raised his arms in greeting. According to a radio announcement, people were lined on each side of the street, from the mansion to the fair grounds, a distance of more than 2 miles.

When the car bearing the President drove out of sight, I walked back to my office and turned on the radio to hear his address and not until then did I discover, in my haste to arrive in time to see President Eisenhower, that I had failed to tie my shoe laces. I'm sure no one was aware of it as all eyes were on the President.

When the President concluded his address, I sat in meditation for a few moments, reflecting on his message, and I was impressed with his sincerity, his Christianity, his humility, his love for his country and fellow Americans. His philosophy recalled the things my father had told me about Abraham Lincoln, whom he knew and admired. My parents were immigrants who learned to love their adopted country and instilled in the hearts of their children a great and abiding love for America and its Presidents. According to my father, Abraham Lincoln was a strong and fearless man, kind at heart, but stern when the occasion demanded such action, human, understanding, sympathetic and truly a great American.

Seeing President Eisenhower reminded me of another occasion when I went to see a President who was passing through Springfield, "Teddy Roosevelt," as he was affectionately known by his fellow Americans. I was a school girl at that time; we were dismissed from class and proudly marched to the railroad station carrying our flags and, when Teddy appeared, we waved our flags vigorously. We were greatly impressed and deeply thrilled to see the President of the United States.

There was another occasion I remember when President McKinley was assassinated. My parents were deeply grieved but I was too young to realize the extent of the tragedy.

Old-time operators like myself will remember when word was received over the telephone wires that President Harding had died. I had just arrived home after working in the central office all afternoon and evening when the assistant night chief operator called me and said, "We have just received word that President Harding has died, and the board is running away with itself." I just missed a streetcar, ran all the way to the office, a distance of eight blocks, and worked until the wee small hours of the morning, with a feeling of sadness in my heart because our President had passed away.

I recall the days of the depression, when President and Mrs. Hoover came to Springfield. There were not so many of my fellow citizens on the street to see the President at that time. People were worried, conditions were bad, and they seemed to feel that the President could do something to improve the situation. There was little cheering, and deep down in my heart there was a genuine feeling of sympathy for the President and his wife, who were facing the situation so bravely; as we know, the passing years have proved that Hoover was truly a great man and is still using his energy for the welfare of his country and his fellow men.

When word was received that Franklin Delano Roosevelt had died, I was in the office of the general manager of the Illinois Bell Telephone Co. in Chicago, Ill. I shall always remember the reaction of all of us when we learned the President had passed on.

Needless to say, every operator working at a switchboard in the United

(Please turn to page 34)

Watch your waste line

By DANIEL SEITZ*

BECAUSE of the inherent characteristics and design of every telephone distribution system, a great deal of unnecessary line may sometimes be found to exist within a telephone plant. This is especially true of party line service where normal growth of the system is often responsible for inefficient groupings of the subscribers.

For example: A sufficient number of applications to fill a party line are received and the necessary line is constructed to fully take care of the present demand. We will call this line No. 1.

Then later, another group of applicants in the same area require a parallel line to be placed on the same pole line with the first group. We will call this line No. 2.

The illustration in *Fig. 1* shows line Nos. 1 and 2, each two miles long, with subscribers located at equal distances apart along each line. Of course, in actual practice they would not be spaced at equal distances apart, however, this arrangement serves to illustrate a condition that frequently occurs in telephone distribution systems.

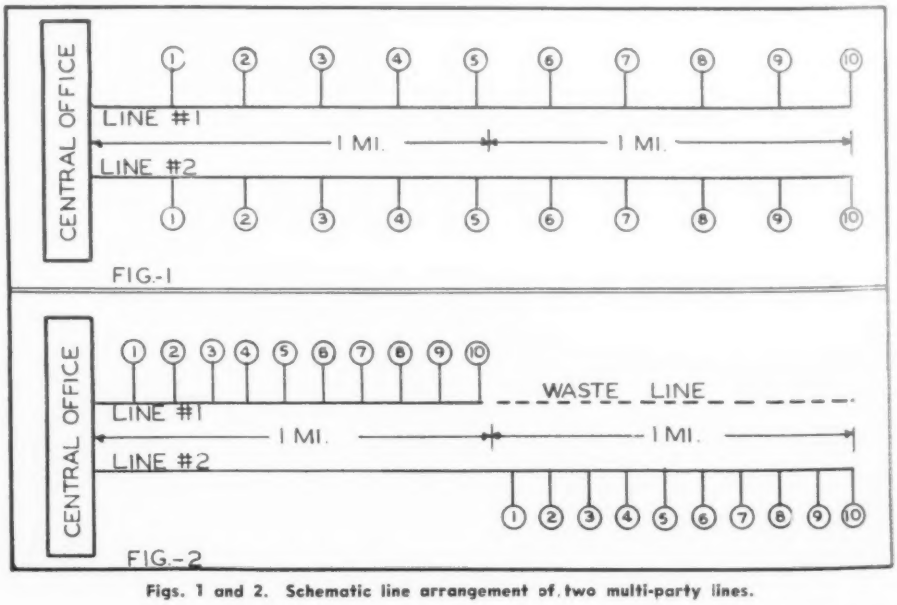
For our purposes, we are showing two multi-party lines with 10 stations on each line, which might be connected either as bridged metallic, divided code or harmonic telephones.

Rearranging the lines by transferring stations 1-2-3-4-5 from line number two to line number one and stations 6-7-8-9-10 from line number one to line number two, we will have an arrangement like that shown by *Fig. 2* which would require only three miles of line, whereas, four miles of line are involved in the *Fig. 1* plan.

The broken line in *Fig. 2* represents one mile of waste line or 25 per cent of the total line shown by *Fig. 1*.

Obviously, to rearrange lines according to the above plan on terminal per line systems would involve numerous number changes which in most cases would prove extremely objectionable to the subscribers except at the time when a new directory is being issued. Later we will explain methods whereby subscribers may be regrouped to eliminate unnecessary line without objectionable number changes.

In many cases, it will prove advantageous, as well as economical, not to remove what we have designated as waste line in *Fig. 2* but to dead end the wire at the last subscriber until



Figs. 1 and 2. Schematic line arrangement of two multi-party lines.

*Mr. Seitz is plant superintendent of the York (Pa.) Telephone & Telegraph Co. and chairman of the Plant Committee of the United States Independent Telephone Association.

such time as additional facilities are required in the area.

Fig. 3 shows a portion of a rural exchange area where by careful spotting of all homes and present subscribers, together with applicants for service, the minimum amount of line is utilized to provide service without waste. The area covered by each line is indicated by the double broken line enclosures.

Highway route numbers are shown as an aid in locating any prospect, subscriber or applicant for service, each being indicated by the code as shown at bottom of *Fig. 3*.

Less waste line means less first cost; also less subsequent maintenance expenditures and, of course, better service for the subscriber. Furthermore, waste line is not only confined to open wire but to loop wire and cable plant as well.

The illustration in *Fig. 4* shows a familiar distribution method employing insulated wire for the line as well as the drops. This is in multi-party area with four to 10 subscribers per line. In this case, insofar as line grouping is concerned, only one line would be required to provide service to the four subscribers indicated as A, B, C and D, providing acceptable means were available so as to be able to shift subscribers from one line to another without changing their numbers or, at best, only at directory time. Such means are available on terminal per station systems, making it possible in many instances to eliminate waste line by properly regrouping the subscribers.

Fig. 5 (page 22) is a schematic of a terminal per station system including the essential equipment. Lack of space does not permit giving complete details of equipment, however, for the purpose of illustration, we hope to make clear just how this differs over a terminal per line system.

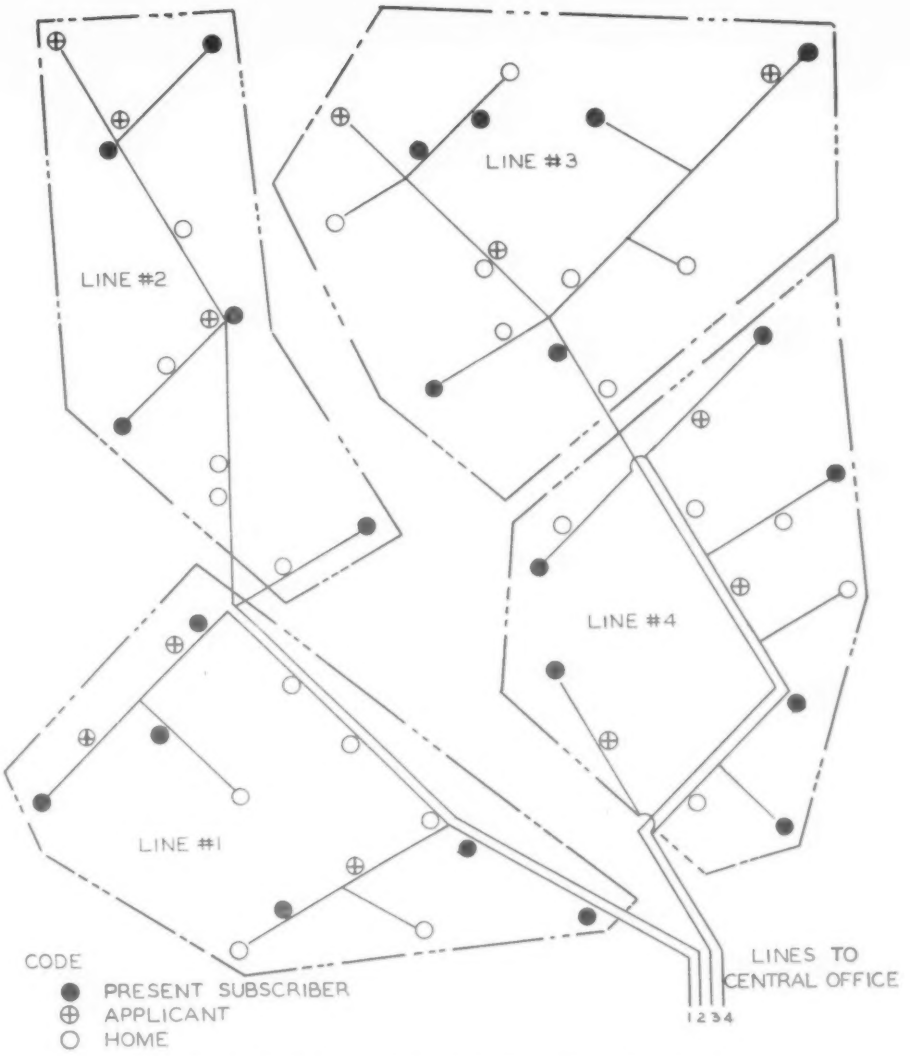
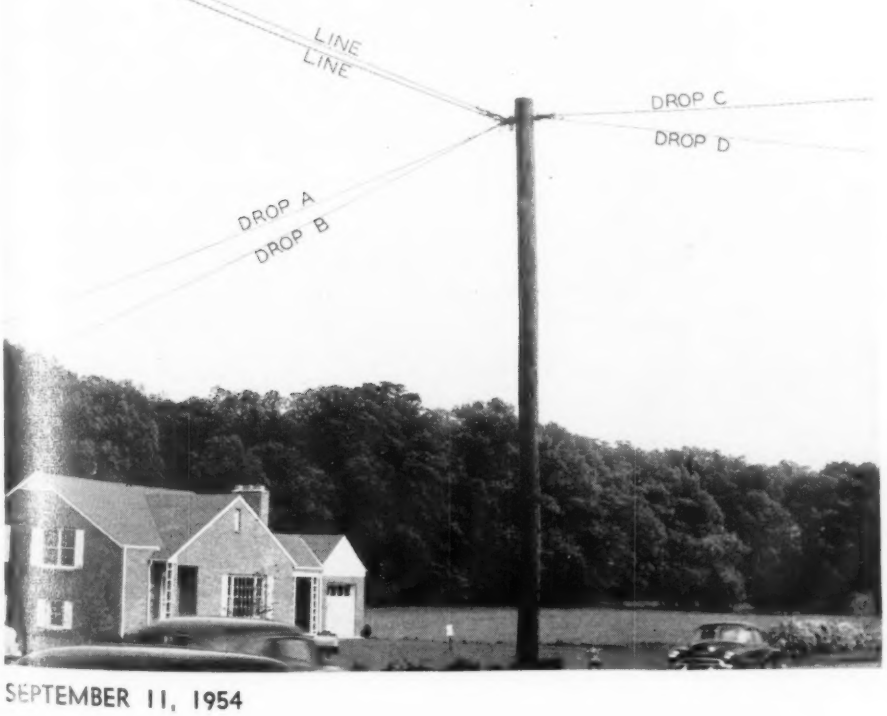


Fig. 3. Rural subscriber line distribution without waste line.

Fig. 4. Waste line on multi-party distribution system.



In a terminal per line system, one piece of central office equipment is common to all the parties on any particular line. With the terminal per station system each subscriber has his own piece of central office equipment and can be tied together with any other subscriber or subscribers' equipment to form a party line. Each connector (subscriber's individual central office equipment) is terminated on an intermediate distributing frame (IDF).

This intermediate distributing frame also has bunching blocks and line finder terminals conveniently arranged so that cross-connections can readily be made between any of these terminating devices. The entire system is so designed that according to the anticipated number of individual and party lines, the proper number of bunching blocks and

(Please turn to page 22)

the finest telephone Leich has ever made...

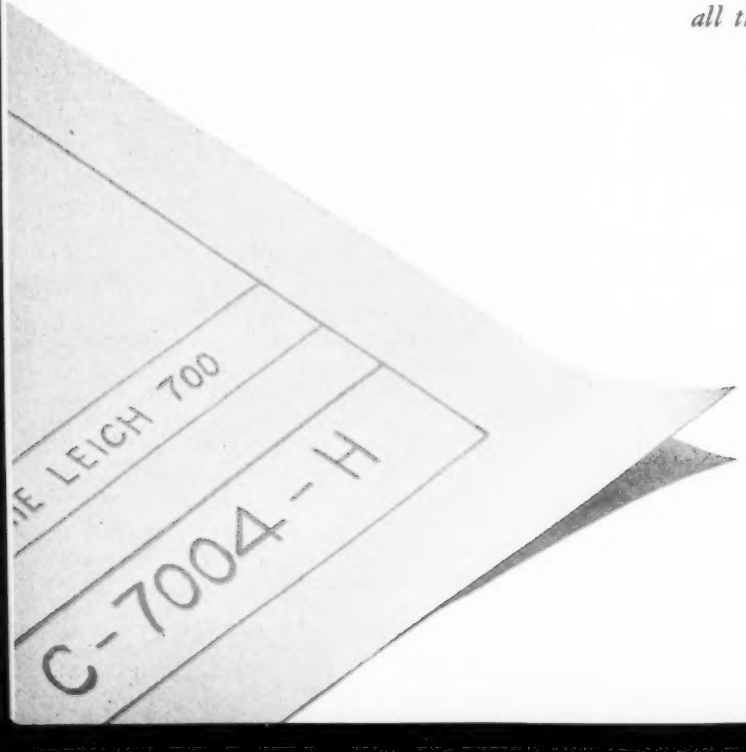
When you examine it — when you use it — you'll almost feel as though you had designed this new Leich telephone.

From the great improvement in transmission to the modern, almost unbreakable case . . . you'll find this Leich 700 has all the things you yourself would have built into a telephone.

This is an entirely new instrument. Every one of its many new features are important and practical.

With this Leich 700, you can offer the finest telephone service ever. Fewer maintenance trips . . . fewer than you ever dared hope for . . . is another advantage you can expect.

Why not write today for the new catalog on this Leich 700 telephone? It describes all important improvements in detail. It's free, so write today.



LEIC

. . . with more features that mean more profit for the telephone company

IMPROVED TRANSMISSION

Leich's new shorter handset places the transmitter closer to the user's mouth. This increases transmission from 3 to 5 decibels, makes this the talkingest telephone you've ever used.

NEW HOOKSWITCH

The new Leich hookswitch is more positive and dependable than ever before. It is actuated by a simple, positive lever action. The make and break springs are positioned by card type stops. Their permanent adjustment will not change in service.

NEW RINGER

The new Leich single-coil ringer is the highest impedance ringer Leich has ever made. It is easy to adjust and adaptable for every kind of ringing.

EXTENDED DIAL RING

This easy-to-read dial, with the numbers on the outside, helps prevent wrong numbers. Your customers will really appreciate this feature.

FLEXIBLE CIRCUIT

The Leich 700 telephone has reliable spade connections. By changing these connections the Leich telephone can be easily and quickly adapted for every type of service in general use.

LONGER SERVICE LIFE

Here's a telephone you can expect to give good service for years with a very minimum of service. All the parts have been carefully designed and made to operate without any adjustment or maintenance required.

ALL PARTS MAY BE INDIVIDUALLY REPLACED.

This is an economy feature of the new Leich 700 telephone. For example — if a condenser is shorted by lightning, it is necessary only to replace the condenser, not a whole network of parts.

SAME TELEPHONE MAY BE USED FOR WALL OR DESK INSTALLATIONS.

This wall-desk feature was developed by Leich. It's part of the design of the telephone. It allows you to use the same telephone for either wall or desk installations. You don't have to buy, add or change a single thing.

HOOKSWITCH LATCH

This optional feature is very popular for party line service. It prevents transmission losses when other parties on the line listen in. It also prevents interference with dial pulsing.

PROVISION FOR TUBE RINGING

Mounting space is provided in the base of the new Leich telephone for ringing tubes. Any one of four type of tubes may be used.

IC MANUFACTURERS OF TELEPHONES, SWITCHBOARDS AND RELATED APPARATUS SINCE 1907

LEICH SALES CORPORATION, 427 W. RANDOLPH STREET, CHICAGO 6, ILLINOIS

PACIFIC COAST: 2611 SAWTELLE BLVD., LOS ANGELES 64, CALIF. SOUTHWEST: 1227 SLOCUM ST., DALLAS 7, TEXAS

GENERAL TELEPHONE TELEPHONE SYSTEM

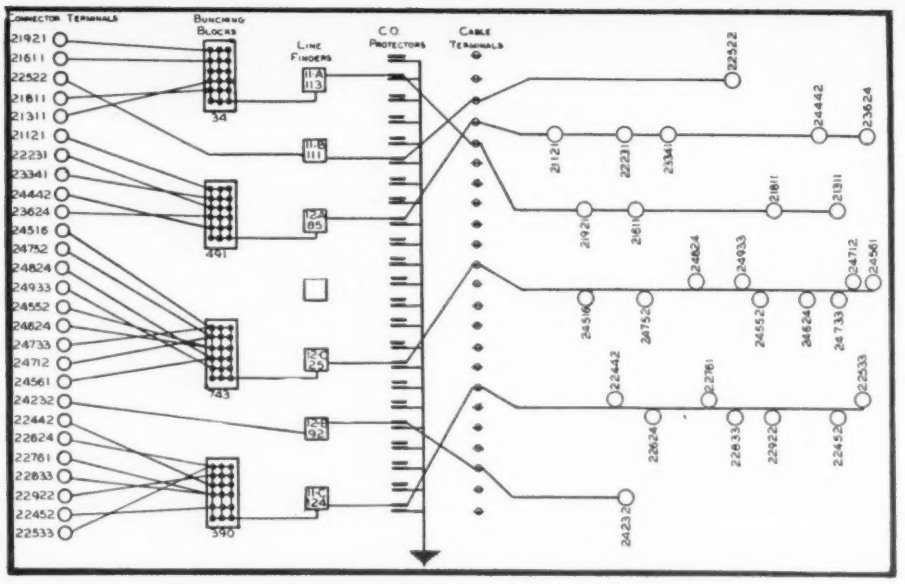


Fig. 5. Schematic diagram of terminal per station system.

line finders are provided for each particular installation.

A typical example might be 3,000 line finders, 1,200 bunching blocks and 10,000 terminals providing for individual and party line service.

The bunching block is exactly what the name implies. It affords a convenient means for grouping the desired connectors (subscribers central office equipment) together by the use of cross-connecting wire. The bunching block is then connected to a line finder terminal and from there to the central office protector and finally the cable terminal.

In *Fig. 5*, individual, four-party, five-party and 10-party line arrangements are illustrated with connectors 21921-21611-21811-21311 forming a four-party line connected to bunching block No. 34 then to line finder 11-A 113.

Bunching block No. 491 is equipped with five connectors. Now, if it were desirable for any reason to shift a subscriber from the five-party line to the four-party circuit above it would only be necessary to move the proper cross connection from bunching block No. 491 to block No. 34 and transfer the subscribers loop affected to the proper line.

The same is true when 10-party lines are involved. In this case, subscribers may be shifted from line to line as required, so long as vacancies exist on the circuit to which the subscriber is being connected.

Modern terminal per station equipment, employing harmonic ringing, does not require that the vacancy on a line be the same frequency as that of the station being added to that line.

You will note that in the illustration the individual lines by-pass bunching blocks, being connected directly to the line finder terminals.

Terminals per station vs. terminal per line systems are far too involved to be covered by this article. We suggest, however, that when considering installation of either of these systems, terminal per station be considered, because of its many advantages.

Our purpose here is to show how, by

(Please turn to page 36)

Fig. 6. Waste line parallel to cable.

Fig. 7. Cable should replace this type of construction.

Fig. 8. Trunk and battery circuits to P.B.X.

CARRIER SYSTEMS

By HAROLD B. McKAY

Part 8—Carrier Troubles

IT IS NOT practical to prepare an outline for trouble-shooting on carrier systems which would cover every case of trouble in every kind of equipment. Each manufacturer makes some variation in his construction, or has features which are distinctive to his equipment. However, the manufacturers usually furnish circuit diagrams and other trouble-shooting aids with the equipment when it is sold.

Nevertheless, all carrier systems have certain things in common, and in a broader sense all electronic equipment can be tested by the same general method. Before discussing equipment troubles, and the methods of clearing them, we should consider first the telephone line over which the carrier operates. In spite of the seeming complexity of the carrier equipment, the fact remains that the line wires are the most frequent source of trouble.

Wire Line

An open wire line is subject to all of the well-known hazards of storms and runaway trucks, and methods of location and repair are well known to anyone who operates a telephone company. However, with carrier on these lines a new set of troubles can arise which would not bother a common battery telephone circuit. In addition the diagnosis of the line trouble can be more difficult because the symptoms are different when carrier is used.

For example, when the wire line of a regular telephone circuit goes open or shorted, it is definitely out of order and will not work at all. In many cases this would also hold true if carrier were in use, but in some cases it would not. Many different conditions can arise, but one will serve as an example to illustrate that care must be used in diagnosing trouble.

Suppose we have a line between town A and town B, which is 20 miles long. Some of the carrier channels work straight through from A to B. Part way between the two towns we might have a branch off of the line to feed a couple of channels to town C, which is off to one side of the line between A and B. If this branch line to C develops trouble, it will usually kill the service to C. (See *Fig. 21.*)

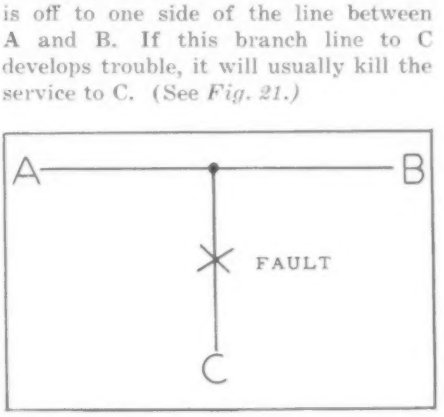


Fig. 21. A wire line which runs from town A to town B with a branch off to town C, can develop a fault as shown. This fault could affect carrier channels running from A to B, thus giving a false idea of its location.

If this were all that happens, the loss of the channels from A to C while A to B remained good, would make it easy to spot the trouble as being on the leg off to town C.

However, it was mentioned in our discussion of transmission lines that a current traveling down a line which did not find a proper termination would be reflected back up the line. Now, if the length of the line to the point of the break is of a critical length in relation to the frequency being used by some carrier channel, the reflecting wave will cancel out the oncoming wave.

Remember, the line from A to B, with the branch to C is one single metallic circuit. Any wave that reflects back from C, will continue right on to the line between A and B. This may cause a channel from A to B to fail, even though there is nothing wrong on the wire beneath these two points, but only because a reflected wave is cancelling out the original one.

This condition is not common, because only failures at definite points along the line could produce this result; however, if it does occur, it would indicate that the trouble lay between town A and the branch-off point, whereas it would really be on the branch to town C.

Men experienced in carrier operation suspect the wire line first in cases of carrier failure, and test the line by means of the accepted methods, rather than try to analyze it from a carrier viewpoint.

Line Construction

It might be well at this point to reiterate the statement that carrier requires a high-quality line. Copper or copper-clad steel is a must, and transpositions are required at intervals, dictated by the frequency of the carrier being used. The purpose of the transpositions, as in voice frequency lines is to introduce a gradual twist or turnover between the two wires. This makes the line the equivalent of a twisted cable pair, and prevents each individual wire from acting like a radio antenna and sending its message out into space and into other circuits (and by the same token, reduces the receiving of unwanted signals).

Failure to transpose properly can cause severe cross-talk between adjacent circuits on the same pole line. In addition, because carrier uses the same frequencies as certain radio stations, these stations may be received by the carrier system. In this connection it may be advisable to avoid routes which would be near noise sources or

powerful radio stations, particularly those in the low frequency maritime service (such as Navy radio stations, or radio beacons).

This is of prime importance. Some companies actually have had to abandon certain channels in their systems because of such interference, even when a cable line was used.

Another factor concerning the line is the impedance of it, as explained under transmission lines. For efficient carrier operation, the line must have an impedance which matches the carrier equipment. And remember, the line impedance may change with weather conditions.

Specific advice on line construction and requirements for carrier systems is usually available from the seller of the equipment.

Cable Systems

While not subject to the hazards of open wire, cable which is used in carrier systems can also be a source of trouble. Cable thus used should have soldered splices the same as open wire, and for the same reasons. Corrosion in a splice, no matter how little, can create copper oxide, which acts as a modulator to alternating currents. This can cause a complexity of noise and crosstalk.

Insulated splices in cable armor, such as are often used in dips under highways to avoid electrolysis, can also cause noise pickup. This is because the cable sheath loses its shielding effect if a portion of it is separated from the rest.

Central offices containing dial switching equipment can also introduce noise on cable pairs which will induce other pairs in the same cable which have carrier on them. This is particularly true with the higher frequency 12 or more channel systems. Remedy for this may require placing of choke coils on all pairs carrying switching circuits. In some cases, relief from the noise may be obtained by breaking the carrier pairs out of the cable armor 1,000 feet or so from the office, and bringing them in under a separate sheath.

Equipment Troubles

It is assumed then, that when a carrier system develops trouble, the line will be checked first. If this proves to be OK, it will be necessary to isolate the trouble into one of the carrier terminals or repeaters. Remember that a single carrier channel consists of two transmitting sets, two receiving sets, a signal sending device and a signal receiving device.

More progress can be made by analyzing the extent of the failure than by yielding to the temptation to promiscuously turn adjusting knobs. The manufacturers, in addition to a detailed wiring diagram, also furnish a block schematic of the carrier layout. A sample of such a sketch was given earlier in this series, and all manufacturers include such a diagram in their promotional literature.

The first thing to do when traffic reports a circuit out is to count your blessings. Test and find out what part is still working. This requires nothing more than the usual equipment for testing out any circuit. Find out if the voice circuit is out in one direction or both directions, if one channel is out or if all of them are out, and if there is more than one system, see if the others are working. If the voice transmission has failed on one channel, see if the signal (ringing, supervision or dialing) gets through. These preliminary tests can be made simply by making test calls to an assistant at the other end.

A new instrument of special value in carrier work is the 400D vacuum tube voltmeter. It can be used with a line matching transformer and a 200CD oscillator for measurements in the carrier frequency range. (Photo courtesy of Hewlett Packard Co.)

Once these facts are determined, a block diagram, or even just the mental picture of a carrier layout, will indicate the direction in which the trouble lies. It is just as important to be able to tell where the trouble is located as it is to be able to fix it. Every troubleshooter ultimately develops his own methods of work, but the following general examples will give an idea of the approach to certain kinds of troubles. These examples are for illustration only; all may not apply to specific systems.

Complete System Failure

If voice and signal is interrupted both ways on all channels of a system it can mean a power failure at either terminal, at a repeater point, or line trouble. Terminal equipment may be equipped with alarm facilities which will notify maintenance personnel if fuses blow, and this should be checked first.

Some carrier systems, as described earlier, may have a line amplifier, which amplifies all channels at once before sending them out on the line. A defective vacuum tube at this point could kill the system. Line coils or protection devices might also cause a failure.

To proceed to clear the trouble, one does just about the same things as he would on a non-carrier circuit. Actually, as will be shown in the section on circuit troubles, the methods of trouble-shooting on carrier follow almost exactly the same methods as are used at present on common battery lines.

The first thing to do is to see if your carrier is putting out its carrier current to the line. Remember, the trouble could be at either end of the line. To check the carrier output a vacuum tube voltmeter is used. The Hewlett-Packard Model 400D is virtually the standard recommendation of most carrier equipment manufacturers. While there is a lot of expensive equipment that can be used with carrier systems, this meter, reasonably priced at about $225 is a must for any carrier installation.

Because the frequency of the carrier currents is so high, they cannot be picked up on a test receiver, and because of their small currents they cannot register on ordinary voltmeters accurately, as will be explained in the section on circuit troubles.

The vacuum-tube voltmeter (usually abbreviated vtvm), when placed across the carrier output to the line will give a reading if carrier is present. Most equipment has jacks or other facilities for opening the circuit at this point, so that the carrier power leaving can be tested as well as the carrier power being received from the distant end. These readings are compared with readings which were taken at the same points when the system was originally installed, and known to be in working order.

This is necessary because the meter will read noise as well as carrier current, and the needle won't tell which it is. Comparison with previous readings will usually show if a condition is near normal.

It should be mentioned here that the old stand-by of both the radio and telephone man, that of substitution of equipment, should not be neglected. If another carrier system of the same frequency is working to the same point, or another usable wire line exists, the quickest way to find out what's wrong

is to "roll" or switch the equipment or the line with facilities known to be good.

If the carrier is leaving the office, the line must be checked, by the usual methods. As a lineman would test the line at various points until he found the break, a test can be made on circuits which have repeaters, which can avoid craning one's neck at miles of wire.

This method, which can be used with some systems, if frequencies permit, is called looping back. It consists of opening the carrier circuit at a repeater station, then feeding it back in both directions; i.e., the transmitter at terminal A will send out on the line to the repeater where it will be sent back to its own receiver. The same thing happens to terminal B.

Tone or other signals can be sent out and received at each end, thus sectionalizing the trouble. The same procedure can be followed at each repeater along the line. This method is also used extensively to locate noise pickup by a wire line. This method will also reveal a repeater which has failed, though the vtvm can be used at the repeater station also if power is available.

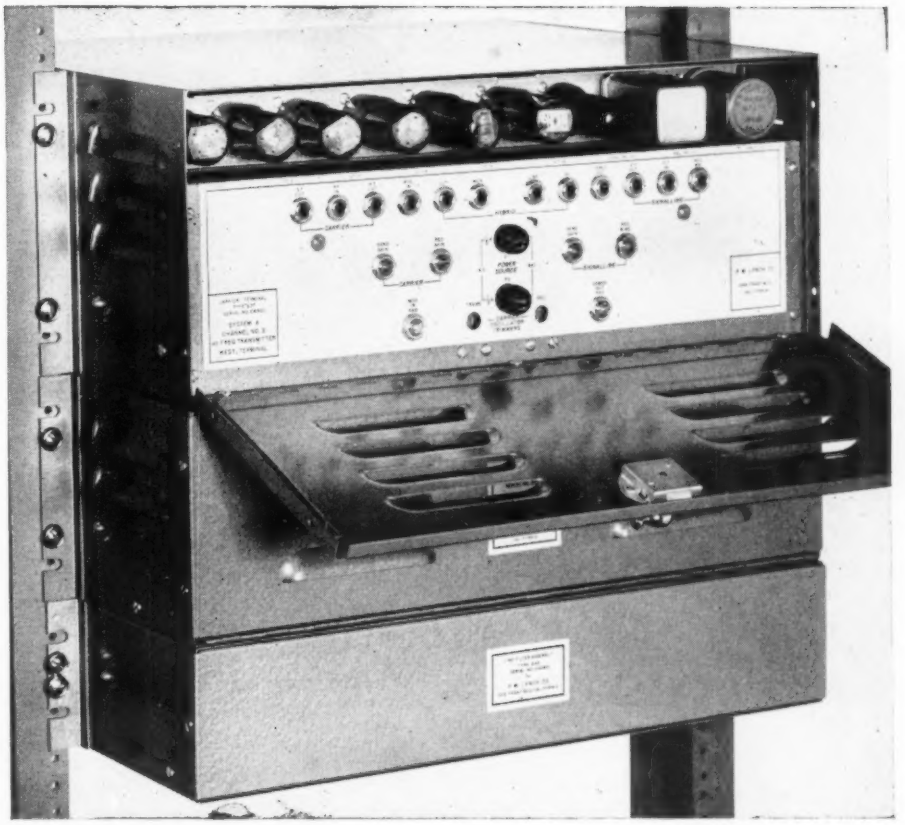
Again, at the repeater station, the substitution method may be used to determine if the repeater has failed, provided there is another repeater which can be used for the swap.

Single Channel Failure

As mentioned earlier, certain trick line conditions can cause one or more channels in a system to fail while others remain working. Again, however, the first thing to determine is whether the transmitter or the receiver portions have failed, and at which terminal.

The direction of failure can be determined by attempting a talking test. Whether or not the channel is leaving a terminal can be found out by using the vacuum tube voltmeter, but this time it should be used ahead of the line filter, at the individual channel output, instead of on the line terminals, which would check all channels. Some equipment has jacks or other cut-off devices for this purpose. Or substitution of another channel can be tried, if the equipment is of the type where each unit can be plugged into place.

If the transmitting portion has failed, no power (or reduced power, compared with previous readings), can be read on a meter. Trouble-shooting is carried out in exactly the same manner, then as with a telephone line which is open. The repairman should "go backwards" with his meter from the output terminals, to what filters or amplifiers



Shown here is a single channel of carrier equipment. At the top, with the door open is the transmitting portion; below this is the receiving unit and then the line filter. The jacks and potentiometer controls appearing on the transmitter panel are for tests and adjustments. (Photo courtesy of Lynch Carrier Systems, Inc.)

may be present through the modulator, until he reaches the oscillator tube, which is supposed to be generating the carrier power. At some point the failure will be discovered, and can be repaired by methods which will be suggested later in the section on circuit troubles.

If the receiver portion has failed, the carrier power from the distant end can be traced with the meter through the various components to the detector or demodulator.

Voice or Signal Failure

If either the voice or signal only fails in systems where these two functions travel on the same channel, a block diagram will indicate which subpart of the equipment is in trouble. Of course, as in the other examples it will be necessary first to determine if the transmit or receive portion has failed. That is, before attempting to find out why your end is not receiving the signal current, it might be well to find out if the other end is transmitting it.

Thus, before starting to dig into the carrier equipment itself, or changing tubes at random, it is smart to think it out first. After you know for sure just what has failed, it is time to find out why it failed.

Circuit Troubles

Adjustments. Carrier systems have a number of variable controls in different parts of the circuit. These include potentiometers for regulating the volume of sent or received speech; for controlling the amount of high-frequency carrier power being put out; for adjusting the degree of the compression or expansion; for providing current of the right value to operate signalling relays and for other purposes.

Normally, these controls are adjusted at the time the system is put into service, or at later times when vacuum tubes are changed. The adjustments normally do not require changing, because once set, they permit a carrier terminal to function correctly with the particular line it is on, as well as with the distant terminal.

Occasionally, a control can be readjusted, particularly on signal circuits to offset aging of a vacuum tube.

However, in general, it is unwise to make adjustments of the carrier apparatus to try to correct trouble which exists elsewhere. In any event, one should never readjust controls aimlessly in an attempt to get a system working. While the controls are as simple as the volume control on a radio set, a carrier system may contain sev-

(Please turn to page 36)

THE PLANT MAN'S Notebook

by Ray Blain, Technical Editor

WE RECEIVED a letter from M. B. Wetzell, general manager of the Champaign Telephone Co., Urbana, O., in which he comments on an item that appeared in the July 3 issue of TELEPHONY, page 43. This item mentioned a possible future scientific advance, hinted in Bell publications, of pushbutton calling instead of dialing. This method has now been commonly used on switchboards for some time, but it appears that in the not-too-distant future, it may also be available for customer station use as well.

Mr. Wetzell states in part as follows:

"You will no doubt recall that a pushbutton dial was manufactured here in Urbana prior to 1910 and was in use in several installations. This dial was a product of the American Automatic Electric Telephone Co. No doubt these dials were developed to overcome patent rights held by others on the rotating dial."

All this proves again that there is nothing new under the sun, especially in the telephone business.

• • •

The cost of each telephone gained by the Northern Ohio Telephone Co. during 1953 was $387.81. A total value of 48.7 per cent of this company's property is presently less than eight years old.

• • •

It has been said that when contentment arrives, progress leaves.

• • •

We have a report that the Department of Entomology at the University of California in Los Angeles, has developed a microphone so sensitive that it detects a termite's footfall, the crunch of food in the termite's jaws, and the tom-tom-like sounds it makes to communicate danger signals to its mates.

The microphone is equipped with a hip-pocket power unit and earphones. After the scientists have completed their job of classifying termite sounds and their causes, this device should make the exterminator's job easier.

• • •

While visiting a job recently where a large dial switching system was being installed, we were surprised to note that they were making good use of a power driven, portable hack saw. We had no previous knowledge that such a device was in existence. Not only was this tool a labor saver, but all types of angle iron being used on the job were cut evenly and accurately.

Certainly this tool will pay for itself many times over on any large dial central office installation job.

• • •

A sign above a cigarette butt receptacle in a large factory carries the following sign:

"Smokers. Good Housekeeping Prevents Fires. Put 'em Here."

Undoubtedly this is good advice, for cigarette butts handled carelessly have certainly caused many disastrous fires.

• • •

The writer recently spent two most enjoyable and profitable days in the factories of the Teletype Corp. in Chicago.

We are now convinced that the printing telegraph is here to stay. The new developments unveiled at this meeting were no less than startling even to old-time communicators. We witnessed the operation of a 600-word-a-minute Start-Stop telegraph system, and we also saw the new Model 28 teletype apparatus in operation. One of these sets was mounted on a turntable that tumbled in all directions while it printed merrily without skipping a letter.

Then there was the Model 28 Page Printer with its stunt box used as a station selector. This is an automatic switching system that really performs. There was also a 100-word-a-minute Tape Sending Set with Send-Receive Page Printers.

The final and perhaps the most startling demonstration was of Transistorized Multiplex equipment in operation. The equipment is much smaller, lighter, and consumes far less current than the vacuum tube type equipment.

Yes, in our opinion, the printing telegraph is here to stay, transistors or not!

• • •

We are indebted to J. W. Channel, out on the West Coast, for a description of his "Silent Helper" testboard. This device can be used by one man to identify pairs in any size cable, quickly and accurately, without the need of any special test equipment.

The pairs involved are first set up quickly in the test board. Then the splicer goes to the end terminal to be cut in and places a tone on the tracer pair. This tone will then come back on the tip of pair two. Then place the tone on the ring side of pair two and it will come back on the tip of pair three. This method can be followed until all pairs are identified.

Although this device is not new, the clever and simple-to-use testboard certainly brings it up-to-date and makes it well worthwhile for any operating company that has a desire to reduce its cable splicing costs.

• • •

We enjoyed reading the article published in the May issue of *Fortune* titled: "Bell Lab's Hired Dreamers." We likewise found the *National Geographic's* article in its July issue, "New Miracles of the Telephone Age," most interesting.

Both of these articles were well-written and proved interesting reading, but we cannot help but wonder why some credit or at least mention was not made of the many inventions and accomplishments of the Independent telephone industry. These accomplishments were numerous, especially in the early days of our industry.

Clearwater, Fla., 6000 lines of Strowger Automatic equipment installed. Highlight was opening of Peninsular Telephone Company's new 3-story building *(At top, right)* which has space for expansion to 20,000 lines, glare-proof windows, air-conditioning, and automatically-controlled lighting. A drive-in window allows customers to pay their bills conveniently.

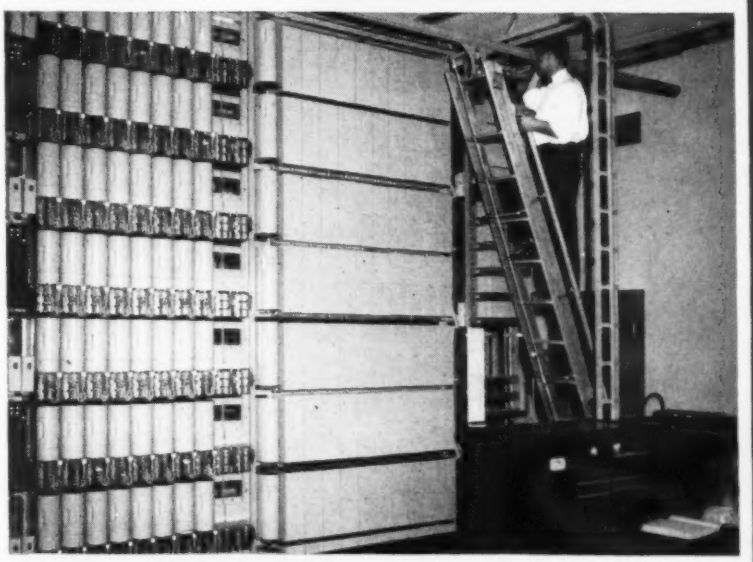
Belvidere, Ill., 2180 lines, tied into the nationwide toll dialing network upon conversion to Strowger Automatic. *2nd picture, right:* H. K. Funderburg, director, General Telephone Company of Illinois, switches power to the new equipment as Robert Mathews, Belvidere exchange manager, watches.

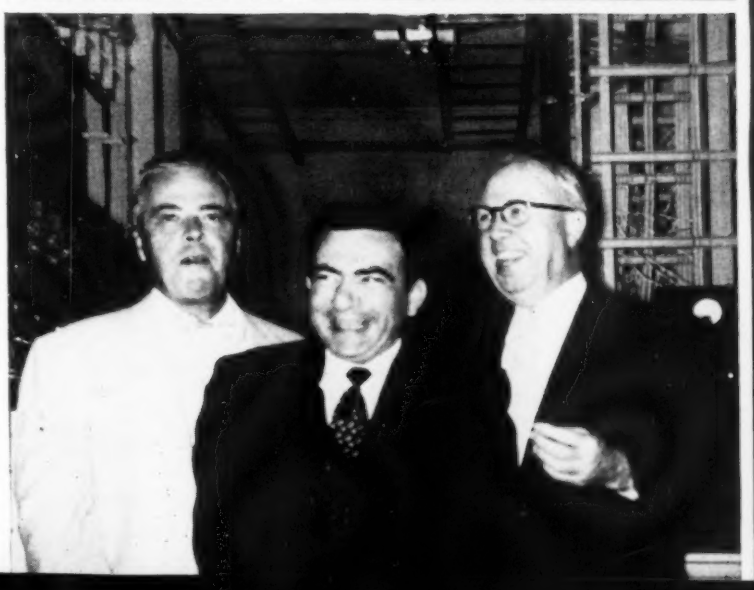
De Quincy, La., 900 lines. An installer *(3rd picture, right)* makes last-minute check before cutover to Strowger Automatic. The equipment trunks to Bell at Lake Charles, where it ties into the nationwide toll dialing network. A smart new exchange building was also built at De Quincy by the Southwestern States Telephone Company.

England, Ark., 450 lines, was recently converted to dependable Strowger Automatic and tied into the nationwide toll dialing network. *At bottom, right:* Carl Wiley of Automatic Electric with Josh Halbert and H. N. Hammond of the Southwestern States Telephone Company enjoy proceedings.

other recent Strowger Automatic cutovers

city	*no. lines*
Wenatchee, Wash.	4000
Sumter, S. C.	3500
Newark, Ohio	3000
De Kalb, Ill.	2500
Beaverton, Ore.	2310
Pacoima, Calif.	2200
Bryan, Ohio	2000
Leaksville, N. C.	2000
Mt. Vernon, Wash.	1250
Valdese, N. C.	1000
Vermilion, Ohio	1000
Chenango Bridge, N. Y.	800
Broadway-Timberville, Va.	700
Chase City, Va.	700
Tigard, Ore.	580
Kernersville, N. C.	400
No. Pekin, Ill.	400
Warsaw, Va.	400
Ft. Branch, Ind.	320
Geneva-on-the-Lake, Ohio	300
Mathews, Va.	300
Saluda, Va.	300
Dillsburg, Pa.	200
Bancroft, Mich.	160
Elizabeth City, N. C.	160
Vaus, Texas	160
Scholls, Ore.	120
Stafford, Ore.	120





PLANT MAN'S QUIZ

by RAY BLAIN, Technical Editor

Q. What is considered necessary and adequate protection of telephone circuits?

A. In order to provide self-protection automatically for telephone circuits against currents and voltages that might prove harmful, three methods are generally used:

(1) Provision of a "safety valve" device for diverting all or part of an excessive voltage by drainage to ground. Open space cutouts or protector blocks are the safety valves used to divert abnormal voltages.

(2) Opening the circuit and thereby disconnecting excessive voltages and resulting currents. Fuses or small-gauge cable conductors in lieu of fuses are used to open the circuit where necessary to remove the hazard.

(3) Employing both these methods in combination.

Heat coils sometimes called sneak current arrestors are used, when necessary, to divert currents — not large enough to operate the fuse, and resulting generally from voltages not large enough to operate like a fuse—to open the circuit if these small currents should continue to flow long enough to make them dangerous. Other types of coils, when operated, ground the line in which they are connected.

• • •

Q. What type of flux should be used when soldering the seam in a split lead sleeve?

A. Cable splicers generally prefer to use stearine for this purpose. This is a pearly, crystalline compound composed of animal and vegetable fats and moulded in ¼ pound sticks.

Prior to the development of stearine, common mutton tallow was utilized for the same purpose. Paraffin, while not a good working substitute, may be used in place of stearine and tallow.

A flux is necessary when soldering to dissolve the oxides which occur on the surfaces of all metals. When heated, this substance dissolves the oxide and enables the molten solder to alloy with the metal surface and effectively prevent a return of oxidation.

• • •

Q. When a key switching system is used to connect several telephones to two or more central office lines, what type of power supply must be maintained on the customer's premises?

A. In most cases, either 24 or 48-volt battery supply can be fed from the central office over one or more cable pairs. When this method is not desirable, a suitable storage battery with a self-regulating, dry disc charger or a battery eliminator to operate from the ac commercial power may be used.

• • •

Q. Will it be possible to splice the conductors in a plastic-insulated and jacketed cable by the use of compression type sleeves?

A. Some experiments have been conducted with compression type sleeves for this purpose, and we understand that they have proved successful.

The compression sleeve is covered with a plastic sleeve to provide the necessary insulation for the conductors. Insulated compression sleeves have also been suggested for this type of splicing and it is believed that they may also be used to advantage.

Experiments to date indicate that more time is required for the splicing of cable when compression type sleeves are used than is required for the twisted type splice.

• • •

Q. Please explain the term "subscriber's loop losses" as used in transmission studies.

A. In actual service, a subscriber's loop is used alternately for transmitting and receiving, and the effective transmission loss which occurs in the loop is not necessarily the same under each condition. As a matter of practical usage, the average of the two losses is determined and this value is commonly referred to as the subscriber's loop loss.

This loss includes not only the loss due to the wires in the circuit connecting the subscriber's instrument with the switchboard, but also the losses which are dependent upon the characteristics of the instruments used and many other factors. Attenuation occurs in a subscriber's loop in the same manner as it does in a trunk and the loss is a function of the length and type of the conductors used to make up the loop.

Transmitters and receivers function in their work of converting sound waves into electrical energy and back again with varying degrees of efficiency. Thus the type of instruments connected to a subscriber's loop has a lot to do in determining the loop loss.

• • •

Q. Will No. 4 porcelain knobs provide adequate insulation for bare iron wire on a metallic rural line?

A. Generally speaking, this knob is considered obsolete and is not commonly used at the present time for a line insulator.

It is suggested that you use instead a standard glass insulator supported either on a cross-arm or a wood bracket. A line is no better than its wet weather insulation and this type insulator will function satisfactorily during inclement weather.

• • •

Q. Will it be necessary to place the power wire in conduit between the storage battery and the power board in a dial telephone exchange?

A. In our opinion, conduit is not necessary if the battery leads can be laced to a suitable rack.

Lead-covered power cable is frequently installed in this manner and proves to be entirely satisfactory.

• • •

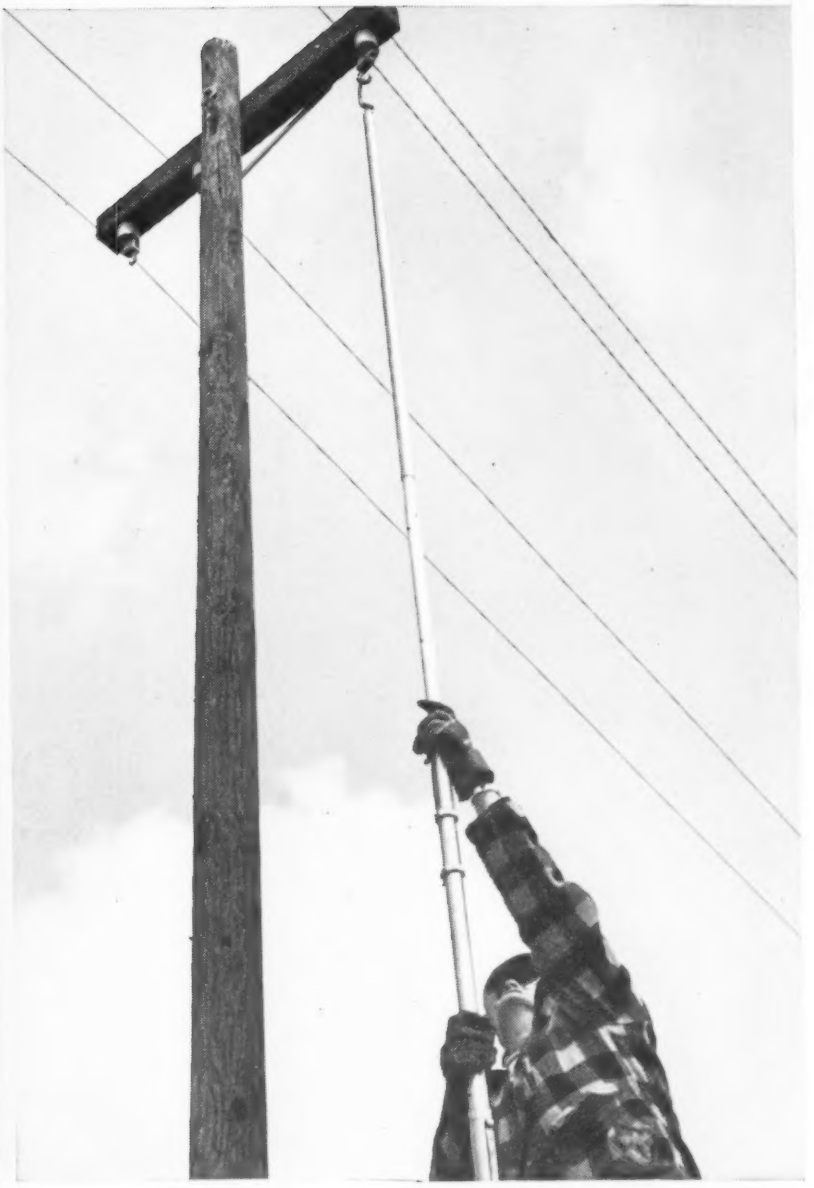
Q. We are presently engineering a new exchange underground cable distribution plant. Will you please give us some information concerning how and where cable stubs should be provided?

A. As a rule, when new main feeder cables are installed, they are of greater pair capacity than is necessary in order to meet immediate load requirements. This is essential for the provision of future growth of the system. There are almost certain to be some points wherein it will be necessary to connect branch cables or additional terminals at some future date.

In order to adequately take care of this condition, with a minimum of work and expense, a short length of cable or a stub is spliced into the main cable at all of these points. With this arrangement, it is not necessary to open the main cable again as the required vacant counts can all be reached in the stub.

The ends of stubs must never be merely closed with solder as this will result in trouble on the pairs involved. The ends of the pairs are all cleared and protected with cotton sleeves and the end of the stub capped with a lead sleeve.

The pole that need not be climbed

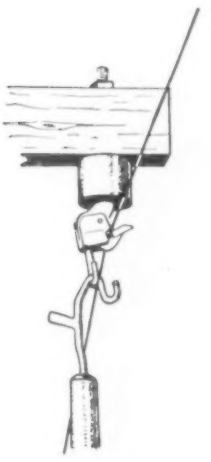


Fastening wires with new tool.

Since telephony began, there has been just one way to install telephone wires on poles: have a trained man climb up and fasten them there. Now Bell Laboratories engineers have developed a special pole line for rural areas. The entire line can be erected without climbing a pole.

The whole job is done from the ground. Light-weight poles are quickly and easily erected. Newly created tools enable men to fasten wires to crossarms 10 to 25 feet over their heads.

This inexpensive line promises more service in sparsely populated places. From original design to testing, it exemplifies a Bell Telephone Laboratories team operation in widening telephone service and keeping costs down.



Key to the new "climbless" pole is this insulator. Ground crews use long-handled tools to place the wire in position and then lock it fast.

Bell Telephone Laboratories

IMPROVING TELEPHONE SERVICE FOR AMERICA PROVIDES CAREERS FOR CREATIVE MEN IN SCIENTIFIC AND TECHNICAL FIELDS

ADVERTISING

Flexible Tool of Distribution

*by Joseph D. Stockton**

A FEW preliminary words will probably be necessary to be sure you all understand the foundation—understand what I may say about distribution and advertising in the telephone business. Of necessity I must speak to those who know the least about my business. On the other hand, I'll assume that most of you are aware of certain fundamentals—thus we save time.

There are differences between a utility and other businesses. We are regulated as to conduct of the business and rates for service. In return for the regulation we achieve certain privileges and protection under the law. Actually, we are granted a sort of hunting license. We have the privilege of making money, if we can, after all regulations are met and if we can find and satisfy the customers in competition with other ways they can spend their money.

But in spite of these differences, our problems in many respects are similar. Distribution to us consists of such things as:

The percentage of families with telephone service.

The amount of telephone service business subscribers have.

The usage of all our services, for example, long distance.

All the extra things, such as extensions, colored telephones, and special equipment and services of all kinds.

Now advertising is an important but changing part of our distribution problem. During the difficult war and early postwar years, advertising was used negatively to help the distribution problem by holding back the demand for service.

Now that we are catching up, advertising is swinging towards promotion. Another point: We use advertising to improve the use of our service. Our efforts to encourage people to place long distance calls by number has improved the percentage so placed from 81 per cent to 88+ per cent.

The extra work eliminated here saves all of us, in expense and telephone costs, better than half a million dollars. And underlying and throughout, advertising stresses the value of the product or service advertised.

Now the point here is that advertising can be a most flexible tool in a distribution problem. In my brief narration, it is used negatively (if you will); positively, that is, promotionally; and institutionally. Putting it in other words:

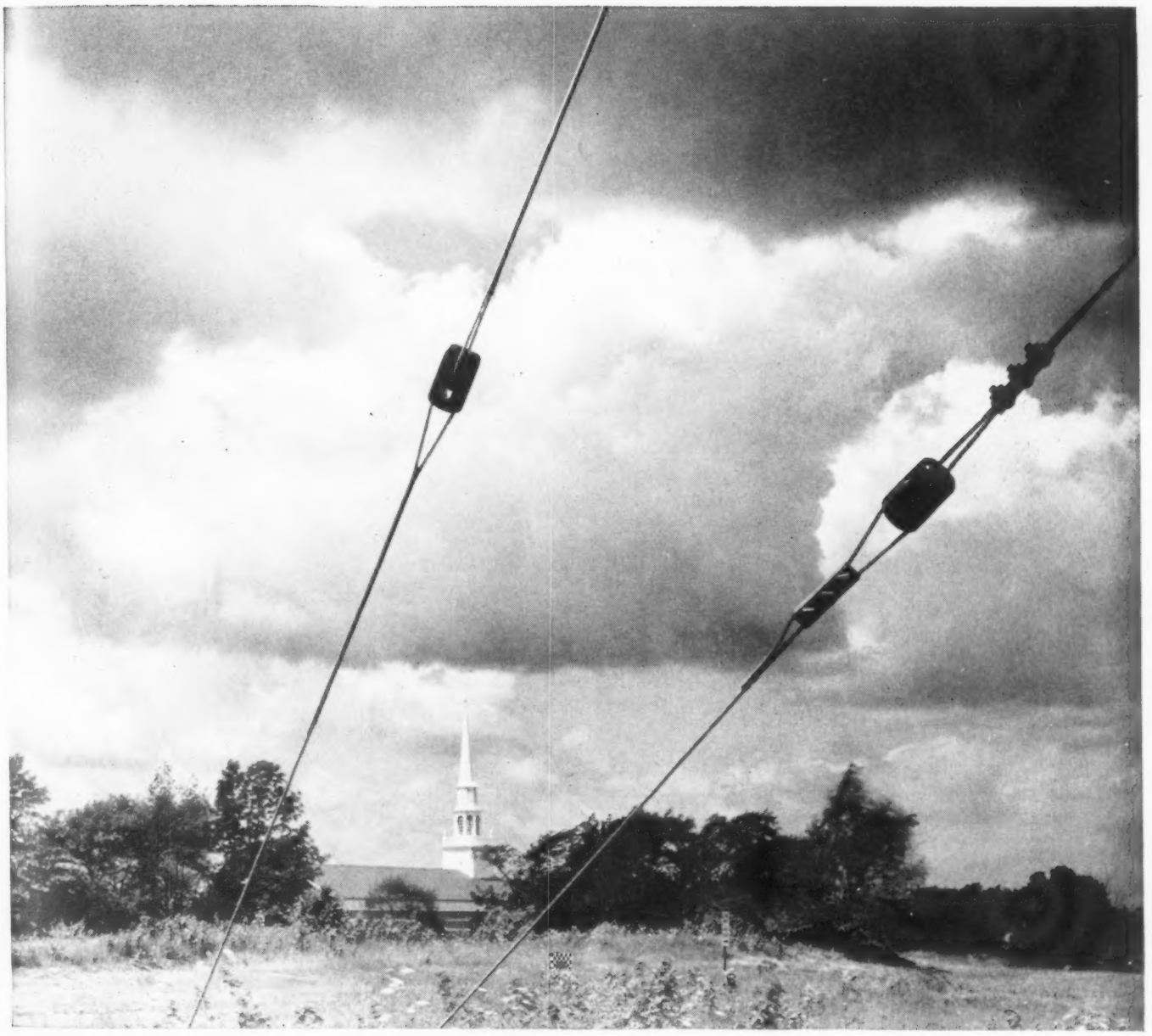
We have used it to say "Don't call."
Now we use it to say "Do call."
We have even used it to tell "How to call."

We find advertising:
Is beautifully current.
Is adaptable.
Can be alive to the needs of the moment.
And it gets results.

Discussing some of the points raised at the second session of the fifth annual *Chicago Tribune* Forum on Distribution and Advertising, devoted to "Management Looks at Distribution and Advertising," are (left to right), JOHN F. McBRIDE, marketing manager, electric range division, General Electric Co.; JOSEPH D. STOCKTON, vice president for operations, Illinois Bell Telephone Co., both of whom were panelists; and PAUL C. FULTON, manager, retail advertising, *Chicago Tribune*, who served as chairman of the meeting.

Now inherent in any distribution problem is an intense study of the market, and again our company is no exception. We know the telephone market is often considered the basic market by many distribution and advertising people, apparently on the theory if you can't afford a telephone, you are not actively in the market for much more

*Mr. Stockton is vice president of operations, Illinois Bell Telephone Co. He presented this address at the *Chicago Tribune* fifth annual Distribution and Advertising Forum on May 18.



Guy-Grips* BY PREFORMED

...Economical...Neat...Efficient

*at the left

PLP

PREFORMED LINE PRODUCTS COMPANY

5349 ST. CLAIR AVENUE • CLEVELAND 3, OHIO

TELEPHONE: CLEVELAND EXpress 1-3571

than the bare essentials. In a way I suppose we should be flattered by this, and we are. You might be interested then in what has happened to this market in recent years and the current picture.

The per cent of families with telephones in Chicagoland has gone from 59 per cent in 1940 to 77 per cent now. Before you tell me, I'll say to you: Yes, families with TV's and even bathtubs, are ahead of us, but the three are awfully close.

Contributing to this gain in telephone families, of course, are increased buying power and the fact that telephone service is a declining per cent of the family budget. Typically in this same period of 15 years or so, it has changed in price less than half other household items.

Here in Illinois we have an interesting reality regarding these family homes. We have about 5¾ per cent of the nation's population but about 6 per cent of its families. Now this perhaps little realized fact is significant to many businesses, such as our own, other utilities, real estate, household appliances and furniture — all cases where the family unit is the market, not the total number of noses. As a matter of fact about half of our growth comes from new households being established and the other half from deeper penetration of the market.

How high can residence telephone development go? I wish I knew. Clearly though, we are getting to the point where each additional 1 per cent penetration comes harder and harder.

Now here's a lesson from us that applies to all of you. We do not have a fixed group of customers. True, many stay with us for years. Typically, residence customers last 5.3 years, business customers four years. (That may be a surprise to you). The range, of course, is from a few days—and up. We don't know which of the new customers will stay with us a long time. So great is turnover, that to gain one residence customer in Chicago we have to add 20. Five years ago it was only eight. Ten per cent of our residence customers leave us each year. In effect, we have a new crop every 10 years. Continuous advertising and selling is needed to reach this ever-changing group.

So, in conclusion, in our business advertising and selling are very much tied together:

We sell and we advertise to increase our revenues.

We sell and we advertise to keep our present customers.

We sell and we advertise to stress value.

We sell and we advertise to improve the use of service for everyone, and

Incidentally, we sell and we advertise to demonstrate to all employes the need for pleasing the customer.

THE OPERATOR'S CORNER

Continued from page 17

States at a time when tragedy occurs in the lives of our Presidents, will remember it, because switchboards throughout the nation are the first to be affected on such occasions. In my short lifetime there have been many occasions, both happy and sad, which shall always stand out in my memory.

There is one other thing I should like to mention which impressed me about President Eisenhower. Despite his high office, he is just one of us, a fellow American with a huge task to perform. "Hello Ike," was frequently heard as he rode along the route to the state fair grounds, and the President grinned, just as any of us would when we are cheerfully greeted by a friend.

If Mamie had been at the President's side, it would have made me very happy. First of all because she is *The* Mamie, the First Lady of our nation, and as you know, I have been known as "Mamie" to my friends in the Telephone Industry throughout the nation and abroad these past 47 years. In my teen age years, I adopted the spelling of "Mayme" as I thought it was a little more glamorous, but I never fooled anyone, as they still called me Mamie, and this included my dad who always referred to me as "My Mamie," in his conversations, and if I were half the person he thought I was, it would really be wonderful.

I'm glad I was privileged to see President Eisenhower. It is an occasion I shall always remember and cherish.

Traffic Questions

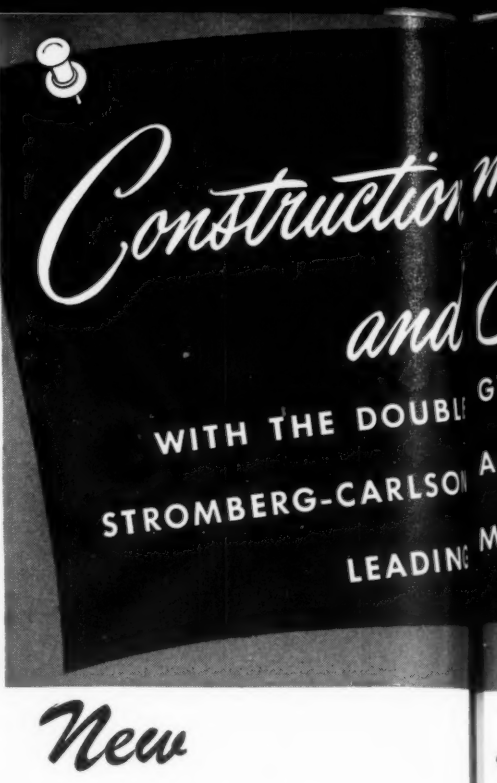
(1) In giving reports, if a report of delay is received in the hearing of the calling party and it is not in code, should the operator repeat it?

(2) If a report of delay has been received and the calling party indicates that he has not heard or understood the report, what action should be taken by the operator?

(3) To whom should reports of delay be given?

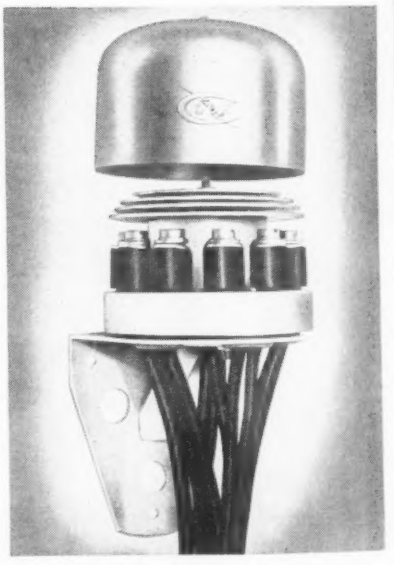
(4) If the telephone is not the one at which a long distance call originated and the answer does not indicate that the calling party is answering personally, what should the operator say?

(5) In giving a report of delay if the operator is unable to reach the calling party personally but some one



New

Cook 5-Circuit power cross protector



You can protect 5 circuits with this new Co
Hy-Cap Power Cross Protector. It provides
single assembly for 5 circuits to be mounted on
10-pin arm, requiring only a single ground wi

It is easy to install with only three mounti
screws and five factory installed pigtail conne
tions. Pole gaining and through bolts are eli
inated.

Small in size, unit is weatherproofed with
aluminum cover and sealed with rubber gro
mets. Heat radiation fins provide an extend
arcing period, and light gauge self-destroy
cover prevents carbon breakdown.

Each electrode is equipped with a fusible elem
which melts and further reduces impedance
the fault current path when the power c
continues over an extended period.

Manufactured by Cook Electric Compan

materials and Supplies

GUARANTEE OF

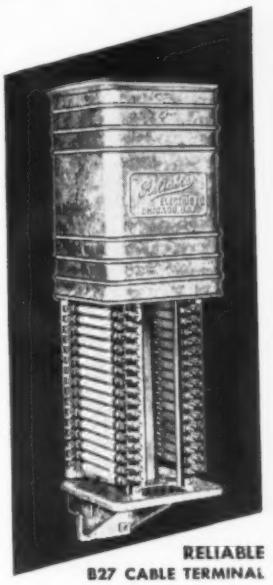
AND AMERICA'S

MANUFACTURERS

a product of actual field study

The Reliable B27 Protected Cable Terminal has resulted from basically sound engineering, supported by actual field experience. It places all connections within convenient reach of the lineman without necessity of removing fuses or reaching around the terminal—also a decided advantage in inspecting.

Detachable mounting bracket permits one-man installation. Ground connection is made directly to ground strip, reducing possibility of high resistance ground. Reliable Self-cleaning Sawtooth Discharge Blocks are standard—insuring dissipation of static discharges without danger of unnecessarily grounding the line.

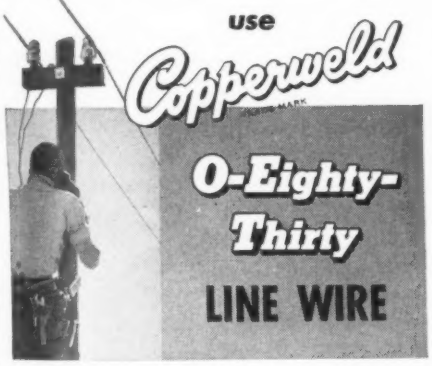


RELIABLE
B27 CABLE TERMINAL

For LOWEST COST RURAL LINES

use

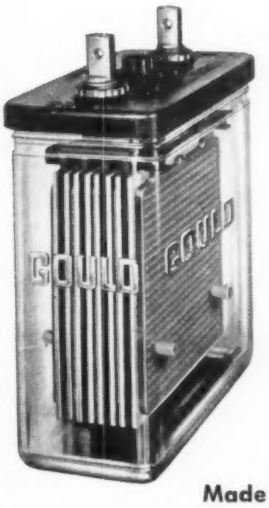
Copperweld



For your short subscriber loops and secondary toll lines, get peak performance at lowest cost by stringing Copperweld O-Eighty - Thirty — the new rural telephone line wire that combines the savings of long-span construction with the economies of a smaller, lighter, non-rusting conductor. In addition to its permanent high strength, it has excellent voice and high frequency transmission characteristics.

Plan now to build your rural lines with Copperweld O-Eighty-Thirty. You'll soon discover it's unequaled in economy.

the battery that lasts practically forever



gould planté

For long life and uniform dependable service, no other telephone battery equals the Gould Planté. It has rolled up amazing performance records, remaining in active full-float service for 20 years, 30 years and longer!

In the Planté, *all* of each positive plate is pure lead, containing *no* antimonial impurities. Thus, Gould has eliminated the primary cause of self-discharge, capacity losses and shortened battery life. Planté batteries float at constant voltage and maintain rated capacity all their life. Because they almost never need service, maintenance is negligible. If you would cut battery costs to a minimum, choose Planté.

Made by GOULD-NATIONAL BATTERIES, INC.

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STROMBERG-CARLSON

ROCHESTER • CHICAGO • ATLANTA • KANSAS CITY • SAN FRANCISCO • TORONTO

High Fidelity Radios and Radio-Phonographs

Office Intercom Equipment

Electronic Carillons for Churches and Public Buildings

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"Panoramic Vision" Television Receivers

AND MANY OTHER ELECTRONIC PRODUCTS FOR OUR ARMED FORCES

KLEIN

Quality you can count on—FOR SAFETY... FOR SERVICE

Yes, safety and service are the two big reasons why Kleins are the choice of the man on the pole. Look for the familiar Klein trade-mark on pliers and climbers, safety straps and belts, lag wrenches and grips. It has been a trade-mark of quality "Since 1857."

ASK YOUR SUPPLIER

Foreign Distributor: International Standard Electric Corp., New York

Write for your free copy of the Klein Pocket Tool Guide today!

"Since 1857"

Mathias KLEIN & Sons

Established 1857 — Chicago, Ill., U.S.A.

3200 BELMONT AVE., CHICAGO 18, ILL.

else volunteers to accept the report, should the operator give it to that person?

Answers are presented on page 40.

WATCH YOUR WASTE LINE

Concluded from page 22

being able to shift stations from one line to another without changing subscribers numbers, waste line may often be eliminated.

Waste line is sometimes due to the lack of cable terminals at the proper locations along the cable as illustrated by *Fig. 6*. Here, a terminal would eliminate not only approximately 2,000 feet of drop wire, but the maintenance cost of this wire as well and, at the same time, add no additional cost for maintaining the cable. Pairs in the cable parallel the drop wires where the circuits would be far safer from storms and mechanical damage.

Another form of waste line is shown in *Fig. 7* where cable would have been more economical long before this maze of wires increased to the number involved. Aside from the unsightliness and cost to the telephone company of such construction, it becomes hazardous for linemen obliged to work on power wires occupying the upper portion of such poles.

In most cases, relatively small plastic cables will provide a better and more economical means for supplying service to offices like that shown in *Fig. 8* where six pairs of loop wire furnish battery and trunks to a small PBX. First cost and subsequent maintenance will be lower on a cable than for a drop wire installation and the appearance is much better when cable is used.

The greatest amount of waste line is frequently not visible because it happens to be within the cable sheath.

The gauge of the pairs may be larger than necessary to provide satisfactory service or perhaps the individual pairs extend far beyond the point where they work. These factors should receive careful consideration when engineering a cable installation.

Resistance and/or transmission are factors that cannot be ignored when planning the cable plant if we expect to prevent waste line as far as possible.

Central office equipment design limits the allowable resistance of the circuit, which is usually in the order of 1,000 or 1,200 ohms, therefore, this is an important factor in cable plant design.

Cable loading frequently can be used to obtain satisfactory transmission on finer gauge cable and thereby eliminate waste line.

The present-day trend seems to indicate that rural subscriber line carrier requirements should not be ignored when engineering certain cable installations, because eventually carrier systems requiring a few low capacity pairs of relatively heavy gauge may displace a considerable number of conventional subscriber circuits and thereby save waste line.

In the final analysis our obligation is to provide high class service between any two telephones. If we accomplish this, then excess wire, either by duplication, length, or size, becomes so much waste line. Take a look, you may have more waste in your plant than you think.

CARRIER SYSTEMS

Continued from page 25

eral controls, some of which will affect the setting of others. Therefore, if controls are turned at random, a complete realignment may be necessary to get the system working again.

As mentioned previously, carrier troubles should be thought out first. For instance, line trouble, or a weak tube at the transmitting end, might cause the voice to be weak at the receiving end. This possibly can be offset by cranking up the receiving volume control until the voice gets louder. This, however, does not fix the defect that caused the trouble and only increases noise levels.

Vacuum Tubes

Next to the wire line, the next greatest trouble possibility is the vacuum tubes in a carrier system. Any vacuum tube ages and ultimately wears out, and the life of a given tube is something that cannot be predicted. A tube fails for different reasons. If it actually burns out, it is easy to find, because it does not light up anymore. But a tube may become "gassy," which means that particles of gas are in the tube which interfere with the electron flow. It may also become weak. Continued electron emission from the filament or cathode takes material off

Order Reprints Now

Reprints of the completed series on "Carrier Systems" will be available following its publication in TELEPHONY (last installment to appear in the Sept. 18 issue), *providing sufficient orders are received to justify reprinting.* Companies desiring reprints for their employes are asked to inform TELEPHONY the quantity they will need as early as possible.

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The binder is made of durable, leather grained imitation leather over stiff boards. It would be an attractive addition to any home or library.

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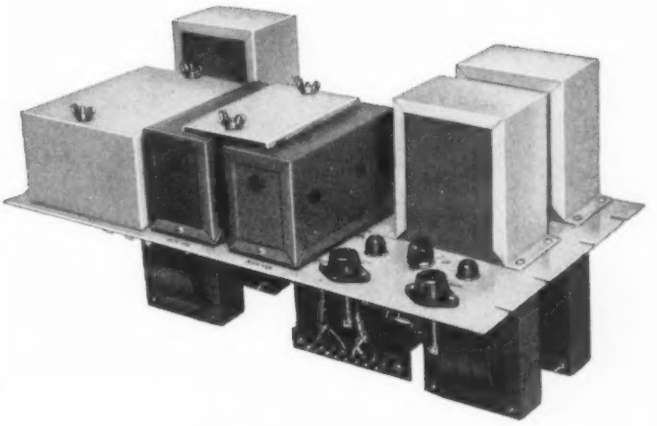

48 V. DC to 115 V. AC

- **Especially recommended for general communications and standby service for telephone, carrier, and microwave applications.**
- **Delivers continuous-duty sine wave regulated power up to 350 watts at 115 volts, 60 cycles from an input of 48 volts DC.**
- **Compact, requires minimum panel space.**
- **Picks up full load within approximately 50 milliseconds of starting time.**
- **80% efficient at full load.**
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VIBRATOR CONVERTERS WITH RAILROAD DEPENDABILITY
by the makers of world-famous C-D capacitors

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of this part of the tube and ultimately the number of electrons and hence the current flow through the tube will decrease.

These conditions of a vacuum tube are not easy to recognize because the tube will still light even though nothing else about it works. Tube elements can also become shorted out to each other due to vibration or sagging while heated.

When a case of trouble has been "thought out" and it is believed that a certain portion of the carrier equipment has failed (such as oscillator, amplifier, etc.), the best thing to do is to change the tube in that part of the circuit.

A tube known to work should be used; a new tube may or may not work in a specific system. A frequently used stunt is to temporarily swap the suspected tube with the one in the same circuit in another carrier channel. Because of adjustment reasons, however, the borrowed tube should be put back where it came from after the test is made. Again, in changing tubes the wise repairman by analyzing his trouble to the sub-unit which has failed, changes only the one or two tubes which could cause the trouble. Nothing is gained by changing all of the tubes in the set.

Tube Checkers. Many radio and telephone men place a great deal of confidence in a tube tester. Another school of thought will have nothing to do with them. The reason for this is that the ultimate test of any tube is whether it will operate in the circuit you want it to work in.

This writer has had to discard many tubes which checked "OK" on a tube checker, but which absolutely would not work in a carrier system. The value of a tube tester in carrier maintenance is doubtful, largely because the testing equipment will not put the same conditions on the tube that are encountered in a carrier.

A tube may work perfectly well when say 150 volts is put on the plate by the tube tester, but may not work at all in a circuit which puts only 80 volts on it. Further, the tube checker may make a test for transmission of a signal at 60-cycle frequency; the tube may amplify 60 cycles but might not amplify 200,000 cycles in a carrier. The vagaries of electronics are such that a tube may work as an oscillator but not as an amplifier. Indeed, very often a carrier or even a television set may be put back in service by merely swapping an oscillator and an amplifier tube which are of the same type.

V V

Pyrke, Briggs Join Staff of General Telephone Service

Allen W. Pyrke and G. Howard Briggs have been added to the staff of the newly created operating department of General Telephone Service Corp., according to an announcement released on Sept. 1 by Donald C. Power, president.

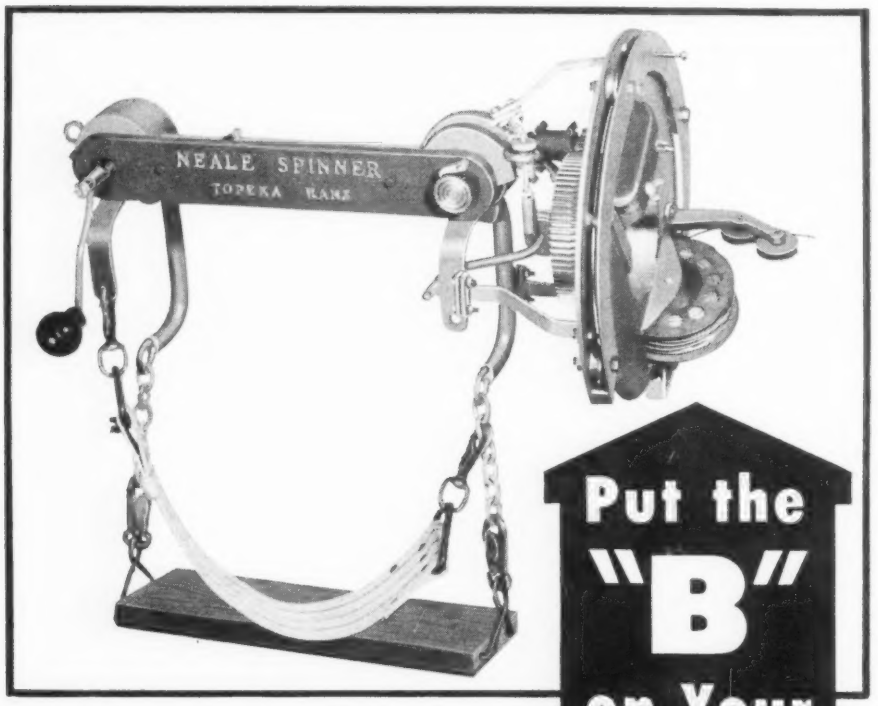
Mr. Pyrke's new title will be traffic director; Mr. Briggs will become commercial director. Both men will report to Fred E. Norris, vice president-operations, and will make their headquarters in New York.

Mr. Pyrke was formerly general traffic superintendent for General Telephone Co. of Pennsylvania, Erie, having joined the system in April of 1946.

Mr. Briggs was eastern division manager for General Telephone Co. of California. He has had various accounting and commercial assignments in the system since joining the California company in December, 1929.

V V

"Let us distinguish between the creation of wealth for the community and the extortion of wealth from the community."—WILLIAM RANDOLPH HEARST, *late publisher.*

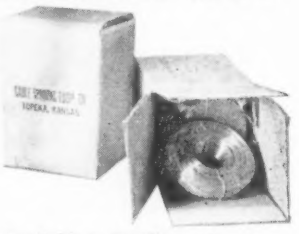


Put the "B" on Your Problems

The Neale Model B is designed for one-man operation. It may be used with equal effectiveness for spinning new cable or maintenance spinning of existing cable. This machine is easy to transfer at pole . . . simply by removing the gate in the spinner head. Many telephone companies . . . large and small . . . have reported success in using this cable spinner to reduce outside plant costs and solve problems of new construction and maintenance.

Contact Your Jobber

For Best Results Use Neale Wire



Available in 7 different types . . . all made to meet the toughest construction and corrosion problems.

THE WORLD IS SPINNING—100% PHONE 2-7234-5

Cable Spinning Equipment Co.

3100 TOPEKA AVE. TOPEKA, KANSAS

TAI Gets Subscriber from British East Africa

Members of the Advertising Committee of the United States Independent Telephone Association, meeting with the Telephone Advertising Institute staff, in their summer session held in Chicago on Aug. 6, were informed of an unusual new subscriber—from British East Africa. The new subscriber is the telephone company which serves the crown colonies of Kenya, Uganda and Tanganyika, and is a subsidiary service of the postoffice of British East Africa. There are approximately 20,000 telephones serving these areas which have a population of over 18 million. This means there is one telephone to about 900 people.

In a letter to Philip Rouda of the Telephone Advertising Institute, M. Warrender Richardson, acting postmaster general of the colony, expressed needs for material which accurately parallel those of privately owned American companies. Mr. Richardson's advertising needs included material on such subjects as prompt payment of bills; giving the person you are calling plenty of time to answer; party line cooperation, and the need of inspirational material to make telephone company employes feel that they are doing an important job.

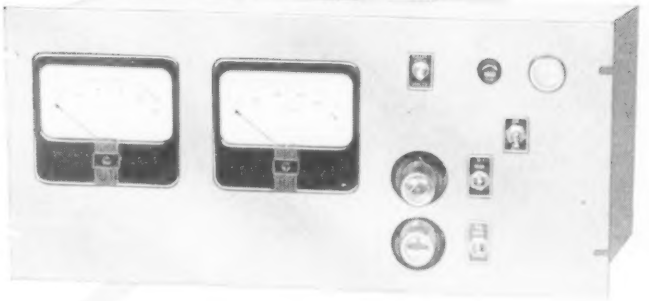
In spite of the obvious differences in the corporate nature of the American private company, and this government subsidiary, Mr. Richardson felt Telephone Advertising Institute material was sufficiently accurate in its existing form to be used in his country.

V V

A weak mind is like a microscope, which magnifies trifling things, but cannot receive great ones.—CHESTERFIELD.

POWER EQUIPMENT COMPANY'S

NEW VOLTAGE REGULATING CIRCUIT



Offers these Design Advantages in Power Supplies!

★ Greater provision for heavier power requirements.

★ Need for fans, blowers or other moving parts eliminated.

★ A VR-105 single voltage regulating tube is only tube used. This has an alternate VR-105 which is used as a ready standby to assure continuous power flow.

★ Filtered to hold ripple voltage in D-C output to less than 0.5% RMS at full load.

★ Not dependent upon accurate maintenance of line frequency. Successfully used with emergency, portable or standby units.

★ New supplies listed in standard sizes.

These new Peco power supplies are designed to do a better job simply, inexpensively and with less maintenance. Write for free bulletin listing specifications and standard sizes.

POWER EQUIPMENT *Company*

Battery Chargers ☆ Battery Eliminators ☆ D.C. Power Supply Units ☆ Regulated Exciters ☆ and other Special Communications Equipment

5740 NEVADA, EAST / DETROIT 34, MICHIGAN

COURTS and COMMISSIONS

N. C. Company Requests Increase To Carry on Expansion

Matthews & Waxhaw Telephone Co. on Aug. 30 asked the North Carolina Utilities Commission for authority to raise its rates by approximately $10,107 a year, revise its mileage charges and establish a new exchange.

The company, chartered on July 18, 1950, to take over the Waxhaw and Matthews exchanges from another company, now serves about 830 subscribers in Mecklenburg and Union counties, and said the increase in rates is needed to carry on its program of expansion and improvements. Extra income, the company said, is needed to allow a rate of return sufficient to attract capital for expanding its system.

The proposed new rates call for increasing the one-party business rate from $5.50 to $7.00 a month; two-party business from $4.75 to $5.50; four-party business from $4.00 to $5.00; the one-party residence rate from $3.75 to $5.00; two-party residence from $3.25 to $4.50, and four-party residence from $2.75 to $3.75.

The company asked permission to figure mileage charges on the basis of road miles instead of air miles, declaring that this was necessary because of the "character of terrain" in its territory. It said the change would "make very little difference in its present billings but will be a help in the future."

The proposed new exchange would be set up in the Indian Trail section by moving present dial equipment from the Matthews exchange and then adding 300 lines of additional dial equipment at Matthews, the main office. The company said it hoped to establish the new exchange by May of next year.

In addition, the company asked permission to capitalize all interest charges as part of its plant account during the construction period ending Dec. 31, 1956. "The reason for this request," it said, "is that the company is still in the formative stages."

V V

Approve Financing Plans Of Virginia Company

The Virginia Corporation Commission on Aug. 25 granted permission to Merchants' & Farmers' Telephone Co. permission to issue $46,900 of common and preferred stock to complete the financing of an improvement program. The balance of the company's $439,900 construction program — the issue of notes to the federal government totaling $393,000—also was approved by the commission.

Frank S. Givens Jr., assistant engineer of the commission, said the program is designed to rebuild the entire telephone system. The company serves 132 subscribers and has applications for 351 more telephones.

Answers to Traffic Questions On Page 34

(1) No.

(2) The operator should repeat all or any part of it, as is appropriate.

(3) Reports of delay should be given to the person who is at the telephone or answers when you ring unless the telephone is not the one at which the call originated.

(4) The operator should say "Is (Mr. Calling party) there?"

(5) Yes, the report should be given to that person.

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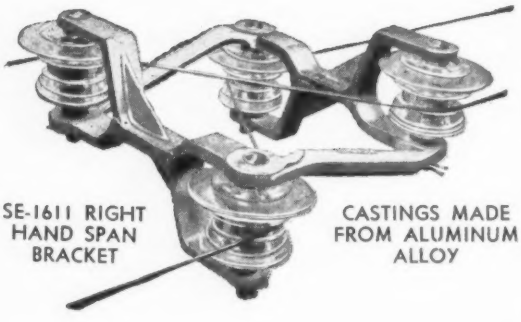

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Schedule Michigan Bell Rate Increase Hearing

Rehearing of the Michigan Bell Telephone Co.'s request for a 22 million dollar rate increase has been scheduled for Sept. 29 by the Michigan Public Service Commission, which broadened the scope of the hearing (TELEPHONY, July 31, p. 32).

Following the original hearing on the rate boost proposal, the commission held the request was not justified because present revenues were adequate.

Commission Chairman John H. McCarthy said on Aug. 28 that when the rehearing opens the commission also will re-examine the company's present rate schedule and investigate its revenues from "yellow pages" advertising and mobile radio-telephone systems.

Company counsel had opposed these proposals, contending the commission should limit itself to hearings on the proposed rate increase.

McCarthy said, however, that the commission always has the right to examine rate schedules.

"The commission rejected the company's first request on the grounds that its revenues were sufficient," McCarthy said. "A new examination of the rates could establish reasons for lowering the rates instead of increasing them, as the company proposes."

V V

Kentucky Commission Resolves Service Area Controversy

Southern Bell Telephone & Telegraph Co. was authorized by the Kentucky Public Service Commission on Aug. 25 to provide service in an area of Hickman and Fulton counties which a cooperative had proposed to serve.

The commission dismissed an application of the H-F-C Rural Telephone Cooperative Corp., Clinton, for approval of its buying six locally owned companies in the area and operating a cooperative system.

In authorizing Southern Bell to provide the service, the commission directed it to do so within four months. It is to take over the local facilities, a commission official said.

The commission's order was given in a case that was back before it after having been battled through the courts.

Southern Bell, which operates a system in part of the area the cooperative sought to serve, had protested the H-F-C co-op's application.

The cooperative's application originally was denied by the commission, which was upheld by Franklin Circuit Court.

When the cooperative appealed, the Kentucky Court of Appeals held that

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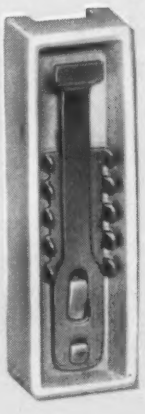

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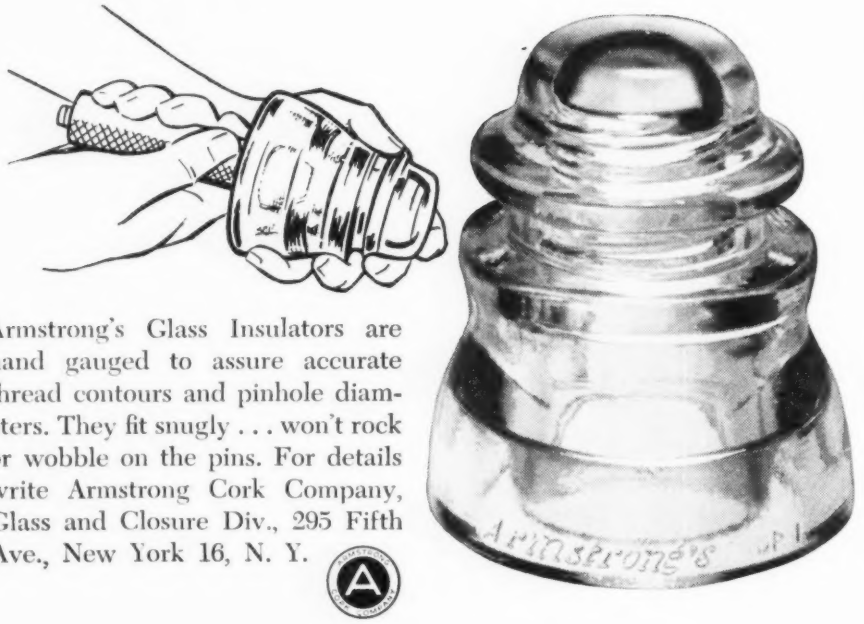

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the cooperative was entitled to serve portions of the rural area outside Clinton, but should not be permitted to take over the locally-owned Clinton company.

Upon a petition for rehearing, the high state court modified its original ruling and sent the case back to the commission for further consideration, resulting in the new commission order.

V V

Order New Telephone Survey For West Virginia Area

West Virginia Public Service Commission ordered on Aug. 30 a new survey of potential telephone customers in the Normantown area of Gilmer County.

The action was taken at the close of a complaint hearing requested by counsel for R. B. Reed and more than 100 other area residents, who maintain that the Chesapeake & Potomac Telephone Co. of West Virginia, has denied them service.

The company made one survey following a hearing last May, but Mr. Reed said the territory surveyed didn't include some potential customers and also went beyond the area where service was demanded. After the original survey, the company estimated the proposed extension of lines would cost $106,000 or $1,150 per customer.

The commission directed that the new estimate of line construction costs be restricted to the territory which the complainants outlined in their petition.

V V

New York Telephone Petitions For Rehearing of Rate Case

Stressing its need for added revenues to offset the effects of mounting costs, the New York Telephone Co. on Sept. 2 asked the New York Public Service Commission to rehear its application for an increase in rates (TELEPHONY, Aug. 14, p. 30).

President Keith S. McHugh, in announcing the action, said the company took sharp exception to both the economic and legal grounds for the commission's Aug. 5 order which denied the application.

He said that "the decision in the long run is bound to hurt the financial soundness of the company and its ability to provide good telephone service.

"That would be as poor a bargain for the telephone user as for the company and the telephone investor," Mr. McHugh declared. "We cannot stand idly by while it happens. The only course presently open to us is to petition for a rehearing."

The company's petition criticizes the commission's refusal to consider the current value of telephone plant as a base for earnings. It points out that the language of the law is so clear that "no other conclusion can be reached than that a value standard was intended," and alleges that the commission errs in holding to an original cost standard far below current costs.

It argues for a more realistic view of what are proper earnings, pointing out that the price of telephone service should be set at reasonable levels in good times like the present, since it is unlikely that the commission would increase them in times of depression.

The petition further declares that the commission is acting contrary to the long-established policy of the state of New York to foster and promote the growth of business enterprise. It says the company has done everything possible to provide the state with good telephone service at the lowest cost.

The company's construction program this year will total 185 million dollars and should continue at the same high level for the next several years.

V V

N. C. Company Gets Rate Relief During Improvement Program

The Mebane Home Telephone Co. has been authorized by the North Carolina Utilities Commission to increase its rates, effective Jan. 1 (TELEPHONY, July 31, p. 32).

The commission last March approved the higher rates and said they could be put in effect after the company completed its modernization program. In its new order, the commission said the company could begin charging the rates on Jan. 1 since the modernization program has been "unavoidably delayed."

The company said it needed the new rates to increase its rate of return which is dropping because of money spent for improvements.

The new rates, compared to those now charged, are: Business, one-party, $6.75 ($4.50); two-party, $5.75 ($3.75), and four-party, $4.75 ($3.00). Residence, one-party, $4.50 ($3.50); two-party, $3.50 ($2.75), and four-party, $2.75 ($2.00).

V V

Asks Ohio Company to Prepare Plan for Improving Service

The Ohio Public Utilities Commission on Aug. 31 ordered the Ohio Central Telephone Co., Wooster, to prepare within 30 days a plan to improve service for its Frazeysburg subscribers.

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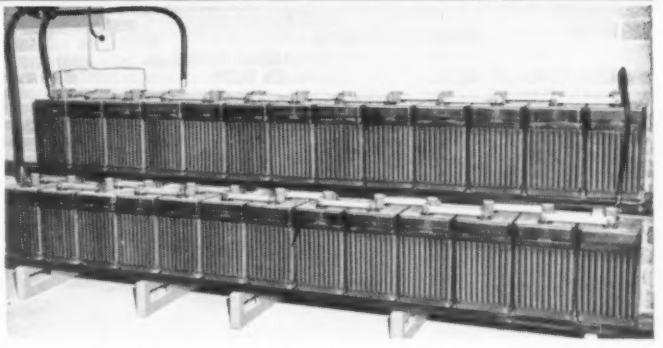

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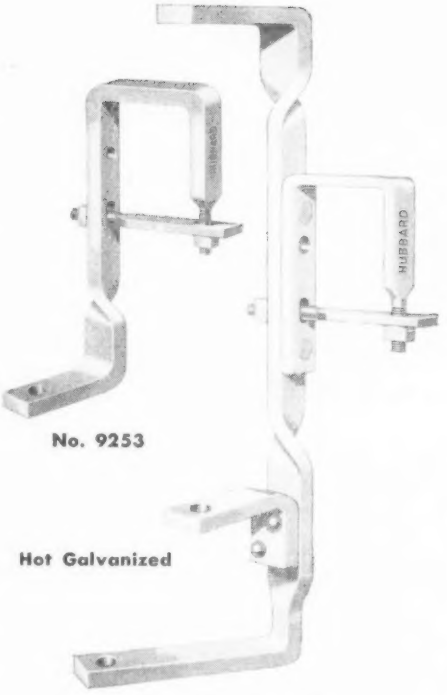

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The order was the commission's answer to a group of subscribers who asked to be switched to Ohio Bell Telephone Co. service. The commission turned down that request and instead ordered service improvements.

A commission attorney examiner, Irvan A. Gorrill, held public hearings last Mar. 2 and Apr. 27, after which he recommended service improvements which the commission on Aug. 31 adopted.

V V

Virginia Independent Seeks 6 Per Cent Return

The Tidewater Telephone Co., Warsaw, recently asked the Virginia Corporation Commission for permission to raise its rates for residence service by 50 cents and for business service by $2.00.

Rodney M. Coggin, president, said the company had not had an increase since 1948, and that since that time 3½ million dollars had been spent for new facilities, and investment per customer had risen from $274 to $399. The rate of return for the year ending June 30 was 4.91 per cent, Mr. Coggin said, and the proposed increases would allow the company to earn 6 per cent.

Mr. Coggin explained that "in order to assure a financially sound company that will be in a position to attract the capital investments which will be needed to enable the company to expand and grow and render satisfactory service to its patrons, it is necessary that additional revenue be sought.

Under the proposal one-party residence rates would be increased from the present $4.00 to $4.50; two-party from $3.50 to $4.00; four-party and multi-party from $3.00 to $3.50.

Business rates would be increased from $5.00 to $7.00 for one-party service; from $4.25 to $6.25 for two-party, and from $3.50 to $5.50 for four-party and multi-party.

V V

Seeks Sale, Rate Increase OK

The Wisconsin Public Service Commission was to have heard on Sept. 8 the application of the Amery Telephone Co. for approval of a rate increase; also the Amery company's request for authority to buy the Little Falls Rural Telephone Co., the Deronda & Dwight Rural Telephone Co. and the Deer Park Telephone Co., Inc.

V V

Justice is the great interest of man on earth. It is the ligament which holds civilized beings and civilized nations together.—WEBSTER.

New Microwave System Links Jacksonville and Orlando, Fla.

A new microwave system, spanning 146 miles between Jacksonville and Orlando, Fla., has been opened for long distance telephone service, the Long Lines Department of American Telephone & Telegraph Co. announced on Aug. 30.

The telephone skyway, a joint project of Long Lines and the Southern Bell Telephone & Telegraph Co., is the first section of a projected route which would eventually extend to West Palm Beach, Fla. Designed to meet the need for additional broadband channels, these new facilities will supplement existing open wire and coaxial cable routes furnishing communications in Florida.

Initially, the new system will supply four channels for telephone service. When all 12 channels on the route are fully developed, it will have a potential capacity for hundreds of telephone circuits and several television programs.

Five intermediate radio relay stations were constructed to flash the microwave signals between Jacksonville and Orlando. The tapered steel antenna-towers at each station range from 200 to 237 feet in height.

V V

Illinois Commission Hears Merger, Rate Applications

A recent Illinois Commerce Commission docket listed the following hearings:

Sept. 7: Applications of the Alhambra Mutual Telephone Co. and the Grantfork Mutual Telephone Co. for approval of a merger of the two—to be known as the Alhambra-Grantfork Telephone Co.—and for a certificate to operate; also for authority to issue 2,500 shares of no par stock to be exchanged for present stock of the two companies.

Sept. 8: Request of the Illinois Mutual Telephone Co., Seward, for authority to raise rates.

Sept. 10: Proposal of the Millstadt Telephone Co. to advance rates at Millstadt and Westview.

V V

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REA Adopts Accounting Policy For Telephone Borrowers

By V. P. RUSSELL, Head, Accounting Section
REA Telephone Operations and Loans Division

THE Rural Electrification Administration, as a lender, is naturally concerned about good accounting on the part of its borrowers. Loan security demands that complete, adequate and accurate accounting records be maintained.

In the telephone program, most borrowers are subject to the jurisdiction of a regulatory body which prescribes systems of accounts. REA's general policy is to require adherence to these existing systems.

As a background for adoption of its accounting policy, REA made a nationwide survey to determine the accounting requirements by state regulatory bodies for telephone companies. This showed that 25 states prescribe the Federal Communications Commission Uniform System of Accounts for all classes of telephone companies operating within the state. Eighteen states generally prescribe the FCC system for class A and B companies and prescribe their own system for class C and D companies. California, New York and Ohio prescribe their own systems of accounts for all classes of telephone companies. Iowa and Texas do not have regulatory bodies with jurisdiction over telephone companies.

Consequently, REA has adopted the following policy concerning the accounting systems of its telephone borrowers:

(A) Each borrower subject to the jurisdiction of a state regulatory body shall keep its accounts and records in conformity with the rules and regulations of that body.

(B) Borrowers not subject to the jurisdiction of a state regulatory body shall use the applicable Federal Communications Commission Uniform System of Accounts outlined by the following publications:

(1) Class A & B companies—Part 31 of the FCC Rules and Regulations

(2) Class C companies—Part 33 of the FCC Rules and Regulations

(3) Class D companies — Recommendations on pages 42-44 of Part 33 of the FCC Rules and Regulations.

In addition, REA asks all borrowers to maintain certain supplementary accounts for recording long-term debt and other loan fund transactions. In the case of non-profit type organizations, additional accounts are also prescribed for memberships, capital certificates and margins. The supplementary accounts are designed to conform to the general sequence and numerical code of the systems of accounts prescribed by most state regulatory bodies.

REA recommends to borrowers that they maintain their accounting records by the double-entry method, on an accrual basis. Also that each borrower maintain its records on a monthly basis and that all transactions, as nearly as can be ascertained, be recorded on the books in the month to which the transaction is applicable. Unless otherwise authorized, each borrower shall close its books at the end of each calendar year.

Experience in the telephone program indicates that many small telephone companies do not maintain adequate accounting records. REA has stressed the importance of maintaining adequate accounting records for the purpose of loan security as well as for material benefit to the borrower. REA accounting personnel have rendered considerable assistance to borrowers in the installation of accounting records; also advice on accounting problems new to small telephone companies, such as acquisitions of property, dismantling old plant and construction of new plant.

It is a general policy of REA to require an annual audit by a certified public accountant (CPA) of each borrower which is operating properties acquired or constructed with loan funds. The CPA is selected and paid by the borrower.

However, REA will ordinarily not require an annual audit until a borrower has completed its major construction program. In the interim, REA personnel will make such audits as are deemed necessary in the interest of loan security.

V V

All that is human must retrograde if it does not advance.—GIBBON.

Gary Group Companies Announce Management Changes

Gary Group operating telephone companies recently announced the following management changes within their organizations:

W. M. Driggs, vice president and general manager of the Texas Telephone Co., Sherman, Tex., has resigned from that position in order to accept a position on the staff of O. R. Roach, consulting engineer in Chicago.

R. S. Griffin, vice president and general manager of the Iowa Telephone & Telegraph Co. and Iowa Continental Telephone Co., Grinnell, Iowa, has resigned that position in order to accept the position of vice president and general manager of the Texas Telephone Co.

Joseph L. Van Horn, vice president and general manager of the Middle States Utilities Co. of Missouri, the Andrew County Mutual Telephone Co. and the Middle States Utilities Co. of Iowa with headquarters at Cameron, Mo., has accepted the position of vice president and general manager of Iowa Telephone & Telegraph Co. and Iowa Continental Telephone Co.

W. C. Murphy, district manager of Iowa Telephone & Telegraph Co. with headquarters at Grinnell, has been appointed general manager of the Middle States Utilities Co. of Missouri and the Andrew County Mutual Telephone Co.

Mr. Driggs has been with the Gary Group of operating telephone companies for a period of almost 10 years. Prior to accepting his position with Texas Telephone Co. in late 1952, he was general plant superintendent for the Illinois Telephone Co. located at Bloomington, Ill. Before joining the Gary Group, Mr. Driggs was with the Illinois Bell Telephone Co. on various work assignments, including the position of senior engineer.

Mr. Driggs has served as chairman of the Plant Committee of USITA, as a member of the Radio Service Committee of the same body and as a member of the Plant Committee of the Illinois Telephone Association.

Mr. Griffin has been with the Gary Group of operating telephone companies over a period aggregating approximately 20 years. Prior to accepting employment with the Iowa companies in late 1948, Mr. Griffin had served in a variety of capacities, mostly in the plant end of the business, with the South Carolina Continental Telephone Co. and the Georgia Continental Telephone Co.

Also, for a period of several years, he served in the telephone industry outside of Gary Group employment and during such period was general manager of the United Telephone Co. with headquarters at Dothan, Ala.

Upon acceptance of his new position, Mr. Van Horn will retain the responsibility for operations in the companies formerly under his management guidance—the two Middle States companies and the Andrew County company.

Mr. Van Horn has an aggregate of approximately 10 years of service with Gary Group companies and at one point in his career was formerly asso-

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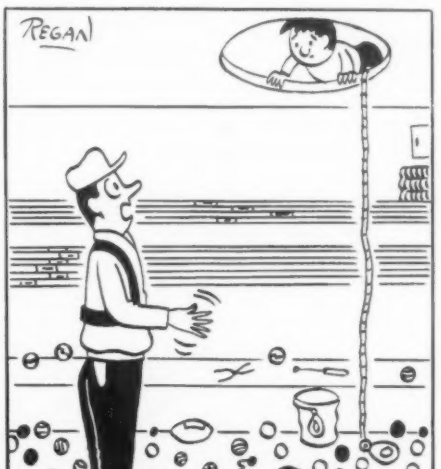

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ciated with the two companies to which he is now being transferred as general manager.

Also in Mr. Van Horn's telephone background was a period of some three years of service with the Lincoln (Neb.) Telephone & Telegraph Co., a position which he accepted immediately following his attendance at the University of Nebraska.

Mr. Van Horn possesses a varied background of business experience which includes a period in which he served as superintendent of communications in the Des Moines ordnance plant of the U. S. Rubber Co. In this position he was responsible for the installation and maintenance of the telephone, radio and time recording systems in this large ordnance installation.

Mr. Murphy has an aggregate of approximately eight years of service with the Gary Group companies, all as an employe of Iowa Telephone & Telegraph.

Also, within the telephone industry, Mr. Murphy was associated for a period of several years with the Western Electric Co. at St. Louis, as an equipment installer and for another period of several years with the United Telephone Co. of Missouri at Fort Leonard Wood, Mo., as wire chief.

V V

Maine Independent Sold After 54 Years Under Same Owners

The Union (Me.) Telephone Co. stock was bought by the Utilities Construction Co. of Springfield, Vt., it was reported on Aug. 13.

The purchasing company is owned by Russell W. Hosmer and Billigene B. Hosmer, of Springfield, Vt., who also operate two other small telephone companies and the Community Television System at Delhi, N. Y. They will maintain the main office in Vermont.

The Union Telephone Co. was started in 1900 by Fred Burkett and Hampton Robbins and now serves some 350 subscribers in Union, Hope and Appleton.

The service is to be completely modernized and cut over to dial.

V V

Private Wire Telephone System To Link Government Agencies

The General Services Administration on Aug. 30 inaugurated a high-speed, 15,000-mile private wire telegraph system to handle messages between government agencies in 53 major cities.

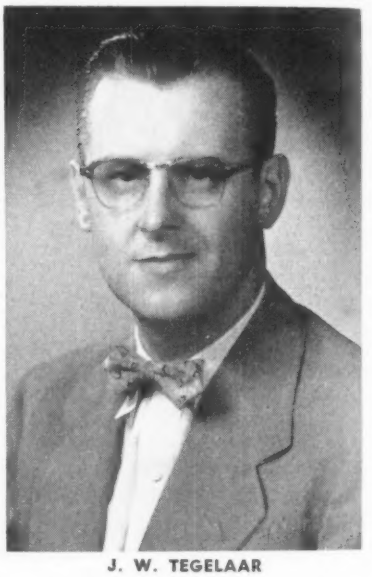
Administrator Edmund F. Mansure said the new system uses ultra-modern communications techniques and is expected, for about $500,000 a year, to give more and faster service at less cost.

The system will be leased from and maintained by the Western Union Co. Previously the government's rapid written communications set-up was leased from the American Telephone & Telegraph Co.

V V

Stromberg Announces Changes in Sales Organization

John W. Tegelaar has been transferred from national sales engineering to Stromberg-Carlson Credit Corp. to fill the position of sales engineer vacated by the transfer of Howard E.



J. W. TEGELAAR

Phelps to Rochester telephone sales, according to T. C. Thompson, sales manager of the telephone division.

Kenneth J. Terry of the telephone engineering department will assume the duties of junior sales engineer under

K. J. TERRY

the guidance of R. O. Hoffman, chief sales engineer of national sales engineering department, Mr. Thompson also announced.

Another change in the telephone divi-

S. B. WEINER

sion is the transfer of Sherman B. Weiner of the national sales engineering department to the SETCO division of Stromberg-Carlson Co. located in Dallas, Tex. Mr. Weiner will become "engineer in charge" of that division.

Mr. Tegelaar was born in Delft, Holland, received his early education there, and came to this country in 1937. After additional study in Rochester universities he joined the Stromberg-Carlson Co. in 1941 where he worked on switchboard assembly. In 1947 he was transferred to systems engineering and in the spring of this year joined the national sales engineering group. During World War II he saw service with the U. S. Signal Corps where he served in field communications.

Mr. Terry was born in Rochester and obtained his early schooling in Ontario, N. Y. He joined Stromberg-Carlson in 1942 after further training in Cornell University and Lynchburg College in Virginia. He worked in various departments in the telephone division, including inspection and installation, after which he assumed the duties of specification writer. His work at Stromberg was interrupted during 1943-46 when he was a member of the U. S. Air Force, serving as a lieutenant with the troop carrier command.

Mr. Weiner, a native of Rochester, majored in electrical engineering at the University of Michigan and joined the company in 1947. He started as an engineer in the test laboratory and later became an instructor in the XY school. Subsequent to this he joined the installation department as a service engineer and then transferred to the national sales engineering department in the capacity of sales engineer. Prior to association with Stromberg-Carlson he was a member of the U. S. Army for four years.

H. W. Skidmore Appointed Leich District Manager

Leslie H. Warner, president of Leich Sales Corp., announces the appointment of Hugh W. Skidmore to the position of eastern district manager.

Mr. Skidmore was previously an assistant district manager. Born and raised in Chicago, he attended the Illi-

H. W. SKIDMORE

nois Institute of Technology and received his degree in chemical engineering from the University of Notre Dame.

Mr. Skidmore was an aircraft maintenance officer and spent two and one half years in the European Theatre of Operations during World War II.

The appointment of Mr. Skidmore was occasioned by a revision of Leich Sales Corp.'s district organization.

Expansion of the company's volume of business and operations has made it necessary to increase the number of sales districts so that individual customers can be given better and more personalized service, Mr. Warner stated.

The new district arrangement divides the country into six geographical areas and places the sales and service functions in the hands of district managers.

The districts are as follows: Southeastern district, Carl W. Schwob, manager; central district, Walter G. McDougall, manager; west central district, Richard D. Friehe, manager; southwestern district, Jack A. White, manager; western district, Kenneth J. Johnson, manager, and eastern district, Mr. Skidmore, manager.

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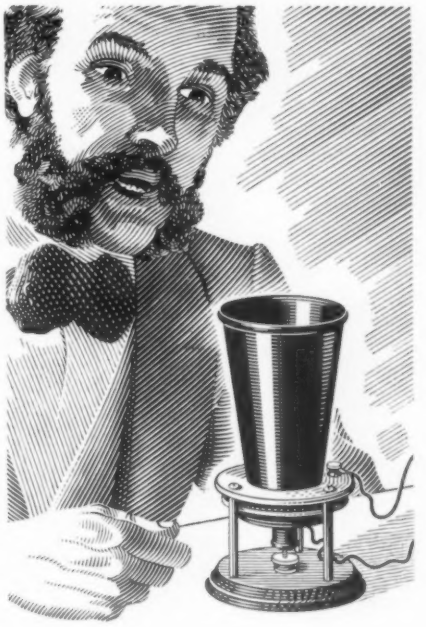
Men are born with two eyes, but with one tongue, in order that they should see twice as much as they say.—COLTON.



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14-Year-Old Boy Shows Promise In Stromberg Training School

One of Stromberg-Carlson Co.'s XY Dial Telephone Training School classes recently listed on its student roster the name of 14-year-old Richard Schmidt of St. Jacobs, Ill. He is the youngest student ever enrolled in the course at Rochester, N. Y., designed to give telephone technicians a thorough knowledge of the XY dial system's circuit operation and apparatus adjustments, plus a program for preventive maintenance and a trouble-shooting technique.

The Rochester *Democrat and Chronicle* featured Richard's attendance in the class in a three-column story in its financial sections.

Richard's father, Roland Schmidt, is an electrical contractor, owner of the St. Jacobs Telephone Co., and part owner of two other telephone companies.

Richard said be began accompanying his father in his rounds when he was two years old. During his spare time from school, he has been helping around the telephone plant since he was 12.

"Oh, I could change a tube," he told the *Democrat and Chronicle* reporter, "and I knew the difference between a selector and a line finder."

When the Stromberg-Carlson crew installed the St. Jacobs company dial system, he was fascinated and spent all the time he could watching and asking questions. Then he determined to learn the basic theories and operating techniques at the school in Rochester so he could become a troubleshooter for his father's company.

Those with him in class noted that his questions showed a surprising grasp of the subject and desire to get at the heart of the matter under discussion.

Now a sophomore in high school, he's certain that he'll make the telephone business his career, but he hasn't decided yet whether he will go to college or technical school after completing his high school course.

V V

Whitney Blake Names E. L. Love Sales Manager of Electronics

John Brown Cook, president of Whitney Blake Co., and Koiled Kords, Inc., both of New Haven, Conn., has announced the appointment of Col. Edgar L. Love, as sales manager of the new electronics division of Whitney Blake Co.

Col. Love is also sales manager of Koiled Kords, Inc., and advertising and sales promotion manager of Whitney Blake.

The electronics division of Whitney Blake is introducing a line of newly designed connectors for the electronics and aircraft industries.

V V

"To be truly and really independent is to support ourselves by our own exertions."—PORTER.

RICHARD SCHMIDT, 14 (center), a student at Stromberg-Carlson XY Dial Telephone Training School, adjusts classroom model as Instructor GEORGE KILLIAN (left) and ROYAL A. CHAMBERS, president and general manager of the Nicholville (N. Y.) Telephone Co., observe his mature technique.

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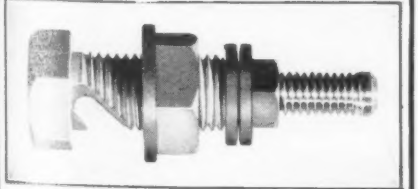

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Ansonia Appoints W. G. Pearson Cable Sales Manager

Walter G. Pearson of Charlotte, N. C., has been appointed telephone cable sales manager for the Ansonia Wire & Cable Co. This appointment was announced by Merle W. DeWees, general sales manager for the company.

W. G. PEARSON

At the same time it was stated that hereafter all sales of Ankoseal telephone cable will be made only through recognized Independent telephone supply distributors.

Mr. Pearson's duties will include full service to the Independent telephone companies under this new policy. His background includes electrical engineering at North Carolina State College and 16 years with the Virginia Electric & Power Co. From 1941 to 1946 he was a lieutenant commander in the U. S. Navy.

In 1946 he established the W. G. Pearson Co. at Charlotte, N. C., and as a manufacturers agent did extensive work in pioneering the establishment of Ankoseal plastic-insulated and jacketed telephone cable over the past six years.

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Coils 25A, 76A, 75A-E-F...$2.00 Each
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1 STROMBERG-CARLSON #120 COMMON BATTERY P.B.X., 70 lines with line relays, 5 trunks. Reconditioned and refinished. Photo on request. Write Box No. 3538, c/o TELEPHONY.

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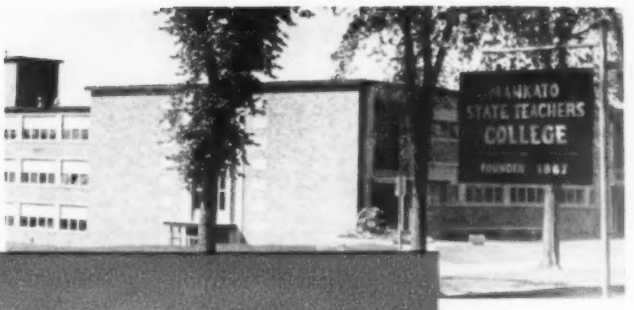

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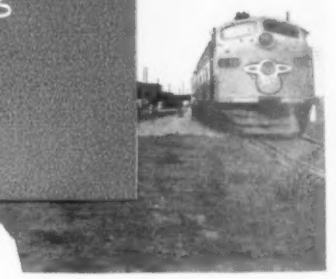

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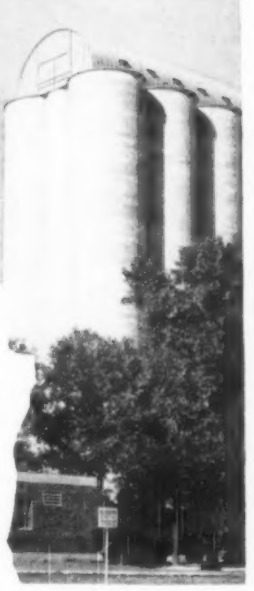
Assistant Manager & Engineer



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